JUNE, 1960

Industrial FINISHING

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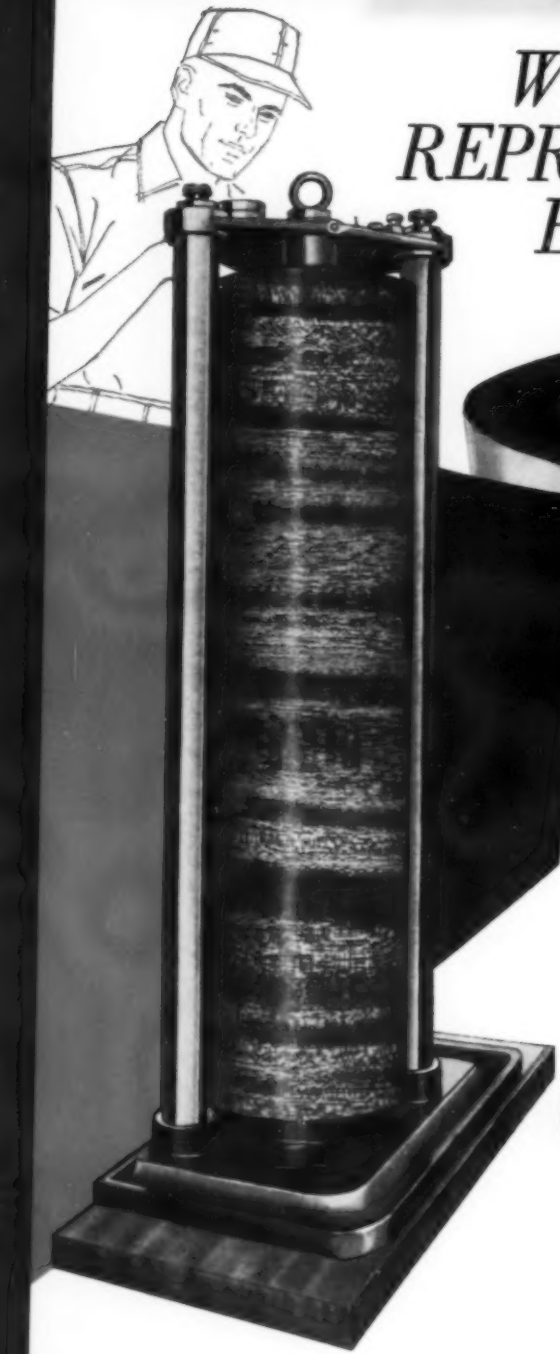
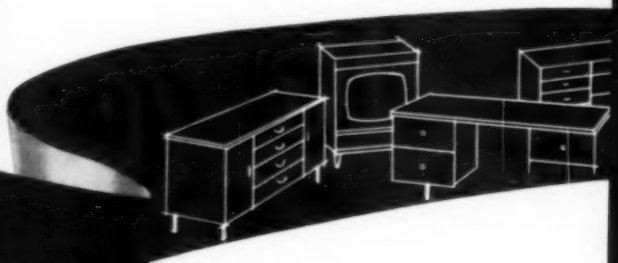
For 36 *Years The Leading Publication Serving The Finishing Industry*

Published monthly by Industrial Publications, Inc., 1172 North Meridian Street, Indianapolis 7, Indiana

WOOD REPRODUCTIONS BY THE MILE





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Industrial FINISHING

W. H. ROHR, *Editor* P. C. BARCHI, *Associate Editor*

June, 1960
Vol. XXXVI, No. 8

BPA

A monthly magazine for company executives, production superintendents, process engineers, chemists, purchasing agents, paint shop and finishing department foremen of industrial plants where product surface cleaning and painting are major operations in the manufacture of parts and products of all kinds.

★

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West Coast Editor
CHAS. R. BROWN

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Accepted as Controlled Circulation Publication at Indianapolis, Indiana

36 **THIRTY-SIXTH YEAR OF PUBLICATION**

Random Comment

Prevents Adhesion. Sep-A-Wax is a new development which consists essentially of a solution of a wax. Since it is a true solution, it deposits a continuous film when it is applied to a surface. The Sep-A-Wax film is insoluble in water or oxygenated materials, therefore it presents an effective barrier to the adhesion of most synthetic finishes and plastics. This makes it useful for masking, mold release and other applications where adhesion must be prevented. It is available in aerosol cans.

The application of Sep-A-Wax is simple. Since its viscosity is low, it may be sprayed on, painted on, or swabbed on with a cloth, or the part may be masked and dipped in the solution. Sep-A-Wax may be cut back with any hydrocarbon or chlorinated solvent. International Products Corp., P. O. Box 118, Trenton 1, N. J.

* * *

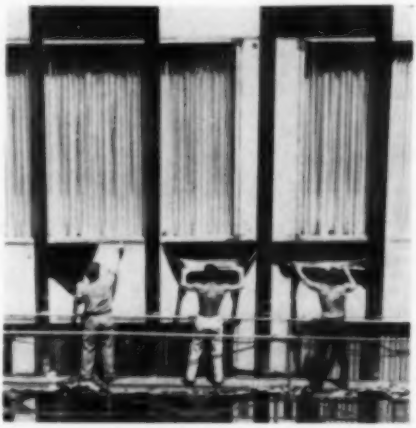
Slides Over Concrete. Did you know that there is a material that can be applied to the concrete floors in your plant to cause objects such as your product or crates or boxes to slide easily? Just a slight push and the object slides as if on ice.

Now you may have visions of a long line of injured employes waiting on the first aid room. It is not so. The amazing thing about it is that treated floors are not slick to walk on. Sounds incredible, but it is a fact.

Magnets Hold Parts on Conveyor. Standard Alnico permanent magnets and special design types are being used for a steadily growing list of applications in plant operations. Their use in conveyor systems eliminates hooks and provides sure holding of parts for the smooth flow of components through every stage of metal fabrication and finishing. For more information write to Empire Magnetics Inc., 111 E. Clinton St., Maumee, Ohio.

* * *

Strippable Coating Protection. The accompanying picture shows three metal workers stripping the white plastic protective peel-off coating from three of 6824 stainless steel pan-



Removing the strippable protective coating.

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Our laboratory and technical engineers will be happy to cooperate in working with you in developing an economical system that will solve any particular problem. Complete systems for wood, metal, etc.

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ave!

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CORPORATION
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els which make up the outside wall of the new Union Carbide building at 270 Park Ave., New York City. The peel-off coating has shielded the stainless steel panels (which have a black matte finish to prevent sun reflection) from general construction and weather hazards during the building's erection.

* * *

Spraying Molten Metals. A new type of industrial process involving nuclear reaction on a small controlled scale was demonstrated in a symposium, May 2nd and 3rd, at Allied Engineering & Production Corp., Alameda, California.

Used primarily for spray coating with molten metals, ceramics, etc., the new process uses very high heat. Almost any non-combustible material can be vaporized and sprayed over another object. In the higher temperature ranges the process is called "plasma flame."

Still in its infancy, the new process

Super-heat plasma flame coating equipment being demonstrated at Allied Engineering & Production Corp. in Alameda, California.

Water-soluble MELAQUA* 600 is hard, solvent-resistant, colorful and non-inflammable

The peril of fire in the formulating process or the baking room is now a thing of the past when Melaqua 600 is used. Melamine resin makes Melaqua hard and solvent-resistant. It is combined with an acrylic polymer for color, high gloss and weather-resistance. Melaqua gives value, and can be the perfect vehicle for a baking enamel with the best characteristics of both the emulsion system and the water-soluble system. See your paint supplier for further information.

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promises advantages for coating objects that are to be subjected to extremely high heat and to unusual abrasion and corrosion.

* * *

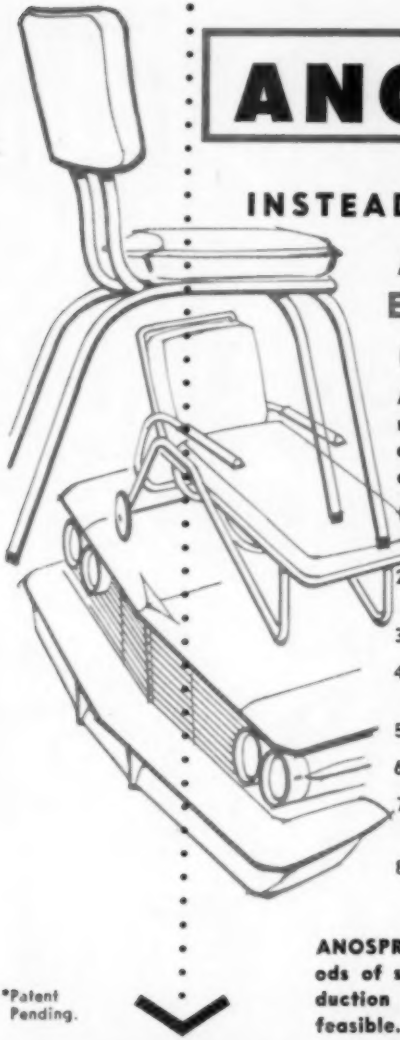
Simulated Art Glass. If you manufacture breakfronts, cocktail and conversation tables, summer furniture, room dividers, folding screens or shower doors you will be interested in simulated leaded art glass for these pieces. It is called Barclite, and it is a translucent, reinforced fiberglass decorated in original designs.

These panels can be used where glass is impractical or too expensive. Fiberglass is more desirable than glass in some respects as it will not break or chip. It is resistant to stains, heat and moisture—and it is easily cleaned with a damp cloth or sponge.

* * *

Aerosol Rust Inhibitor. Crown Fortified Lanolin Rust Inhibitor provides a new approach to the rust problem. Fortified lanolin absorbs up to five times its own weight in water, eliminates the possibility of rust forming as a result of air moisture present on metal when Rust Inhibitor is applied. It also protects against condensation of moisture caused by temperature fluctuations and neutralizes acids that may be formed by corrosive atmospheres. Once applied, it sets up a protective film barrier that assures lasting protection.

The coating is applied in a fine jet mist spray which penetrates cracks, crevices and hard-to-get-at places. Oil soluble, it need not be removed before using oil or grease, even on close fitting surfaces. It can be removed with any plant solvent if desired. Crown Industrial Products Co., Woodstock, Illinois.



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5. Minimized loss of reflectiance value.
6. Improved brightness.
7. Protective treatment on alloys which connat be bright anodized.
8. Excellent clear for brass, chrome and other metals.

ANOSPRAY may be applied by conventional methods of spray, dip or brush. Normally in high production plants, spray application has been most feasible. *Write or phone for technical bulletin.*

*Patent Pending.

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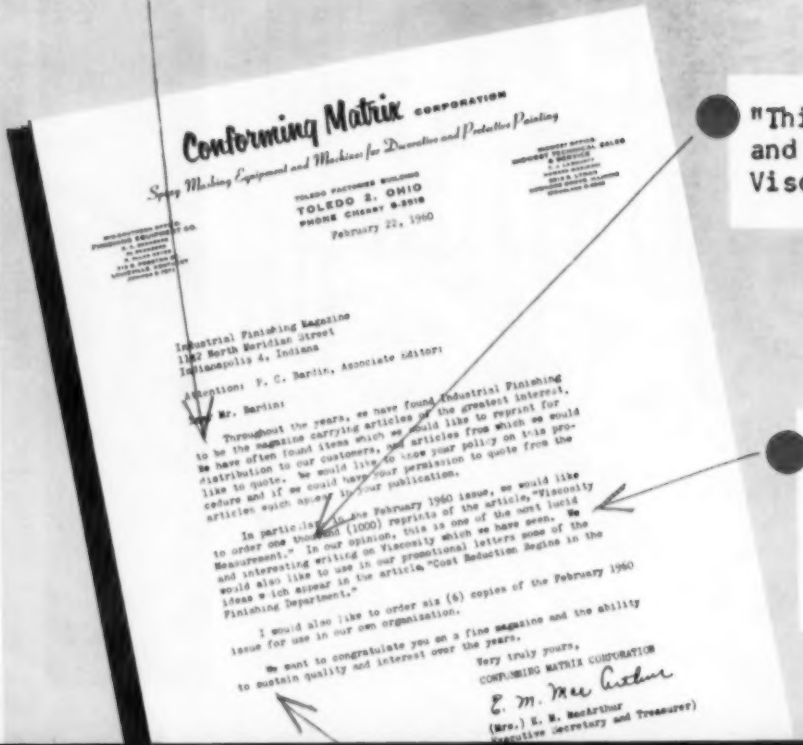
"Throughout the years we have found Industrial Finishing to be the magazine carrying articles of greatest interest."

"This is one of the most lucid and interesting writings on Viscosity which we have seen."

"We would also like to use in our promotional letters some the ideas which appear in the article 'Cost Reduction Begins in the Finishing Department'".



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TOLEDO 2, OHIO
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February 22, 1960

Industrial Finishing Magazine
1152 North Meridian Street
Indianapolis 4, Indiana

Attention: F. C. Berlin, Associate Editor

Dear Mr. Berlin:

Throughout the years, we have found Industrial Finishing to be the magazine carrying articles of the greatest interest. We have often found items which we would like to reprint for distribution to our customers, and articles from which we would like to quote. We would like to know your policy on this procedure and if we could have your permission to quote from the articles which appear in your publication.

In particular, in the February 1960 issue, we would like to order one thousand (1000) reprints of the article, "Viscosity Measurement." In our opinion, this is one of the most lucid and interesting writing on Viscosity which we have seen. We would also like to use in our promotional letters some of the ideas which appear in the article, "Cost Reduction Begins in the Finishing Department."

I would also like to order six (6) copies of the February 1960 issue for use in our own organization.

We want to congratulate you on a fine magazine and the ability to sustain quality and interest over the years.

Very truly yours,
CONFORMING MATRIX CORPORATION
E. M. MacArthur
(Mrs.) E. M. MacArthur
Executive Secretary and Treasurer)

"We want to congratulate you on a fine magazine and the ability to sustain the quality and interest over the years."

Above are some of the reasons why Industrial Finishing carries more advertising of paints, varnishes, lacquers, synthetics (organic finishes) than all other publications combined. Other reasons — largest circulation to firms using organic finishes — quality editorial exclusively on finishing operations.

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"I have learned a great deal over the years from your fine magazine, INDUSTRIAL FINISHING, and look forward each month to receiving my copy."—*M. A. Brandt, Foreman, Appleton Chair Corp., Appleton, Wis.*

"We, at Reliance, certainly enjoy your monthly issue of INDUSTRIAL FINISHING Magazine, and find it to date one of our best mediums of advertising." — *J. C. Hendershot, Vice President, Reliance Varnish Co., Louisville, Ky.*

"Please enter our subscription for one year to INDUSTRIAL FINISHING Magazine. We believe it will be very useful in conjunction with the manufacturing and sales of our products to the industrial trade."—*H. Clausen & Co., Inc., Fords, N. J., H. Clausen, President.*

"Your publication has come to our attention. We are a progressive concern and being one of the largest of its type in the Boston area, we are constantly on the lookout for new products and new ideas. We know your magazine INDUSTRIAL FINISHING could help. Please enter our subscription."—*The Chippendale Shop, Inc., Brookline, Mass. S. W. Kohn, President.*

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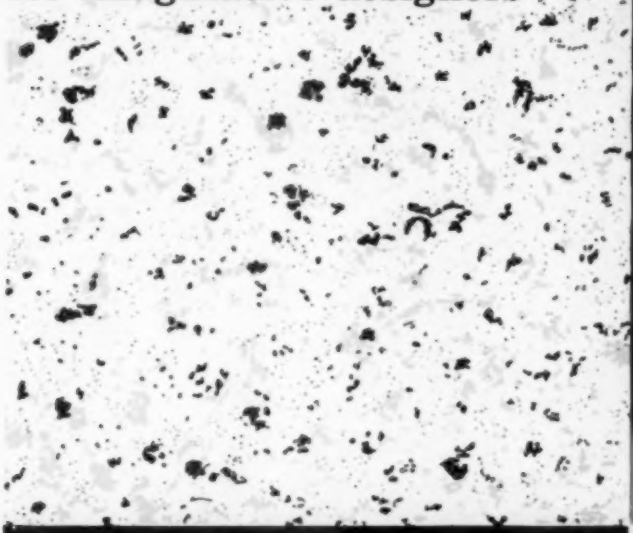

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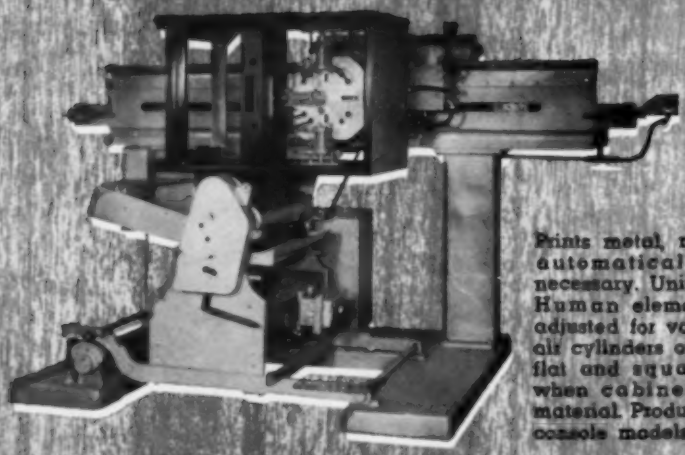

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Wood

This machine is built in various sizes from the narrowest up to 38" wide, for the graining of various sizes and thicknesses of panels, tables and similar work. Can also be used for edge graining. Explosion-proof motor is mounted beneath a solid base, eliminating fire hazards.

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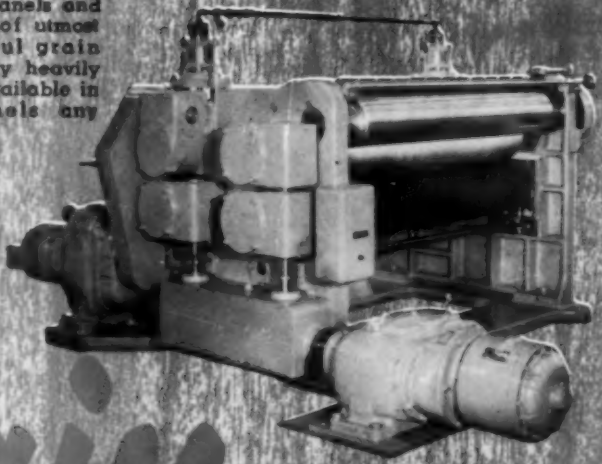

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For further information on what manufacturers have to offer —literature, products, supplies, etc., mentioned in the editorial departments, use the "Reader Service" return card in the rear section of this issue, page 136.

Industrial FINISHING

June, 1960, Issue

Reader Service Department

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☐ Second Cover ☐ Third Cover ☐ Back Cover

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Send your inquiries to

INDUSTRIAL FINISHING Magazine for information about technical paint coating problems, methods and processes; and for sources of supply for organic finishes, equipment and supplies to be used in connection with surface preparation and conditioning, paint application, sanding, paint drying, and baking, rubbing, polishing, etc.

Surfaces to be completely or partially coated for protection, decoration or for any other purpose, include components and articles made of metals, plastics, woods, and composition materials; also paper, leather, rubber and fabrics.

The services of many testing laboratories, finishing consultants and special technicians are often available.

These inquiries are promptly answered. As a result, new products, materials and sources of information are continually being uncovered; valuable contacts are made and timely suggestions for future articles to be published are often developed.

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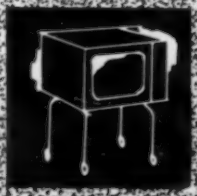

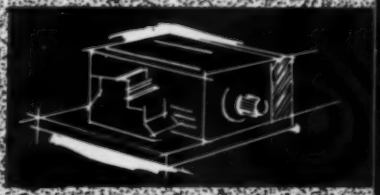

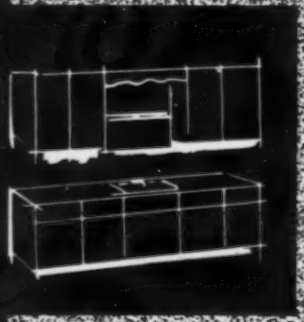

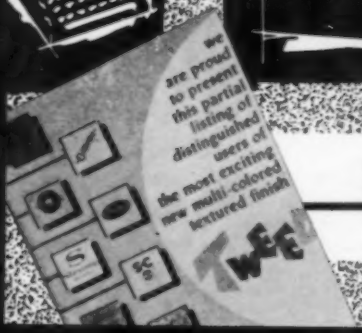

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This advertisement is appearing in Furniture World and Furniture South

Now...white finishes that stay white

Non-yellowing, stain resistant Butyrate lacquers are solving one of the furniture industry's most difficult problems...age-discoloration and staining of white and light-colored finishes.

These new, water-white topcoat lacquers are based on tough, durable Half-Second Butyrate, an Eastman film-former.

First used successfully as a coating to preserve the finish on outdoor aluminum, Butyrate lacquers now are available to provide lasting protection for quality wood finishes.

A new concept in color-stability for wood finishes

NON-YELLOWING, STAIN RESISTANT

BUTYRATE

TOP-COAT LACQUER

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an Eastman film-former

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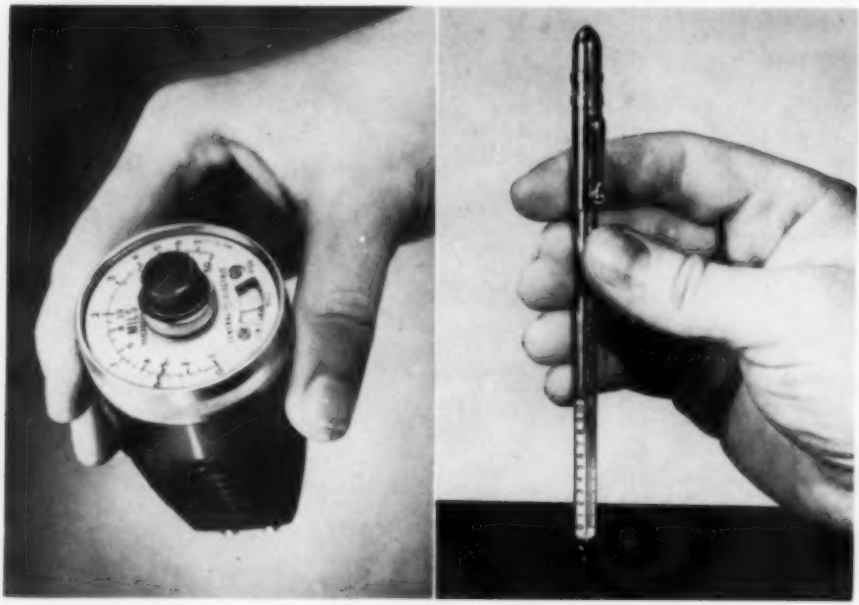

Paint Film Thickness

By Karl Schrieber
Senior Paint Chemist

THE IMPORTANCE of correct film thickness in industrial finishes is frequently overlooked; yet to do so can be costly from the standpoint of quality or economy.

The thickness gauges shown above will not damage the coating being measured; they will indicate the thickness of paint coatings on magnetic iron or steel surfaces. The one at left is a General Electric; the one at right is a Tinsley. Photographs, courtesy of Gardner Laboratory, Inc., Box 5728, Bethesda 14, Md., and James G. Biddle Co., 1316 Arch St., Philadelphia 14, Pennsylvania.

This raises the question: *What is the correct film thickness?* No general answer can be given, since this value should be based upon the type of product being coated and the performance characteristics expected of it. On an automobile engine part, such as a water pump, an inexpensive semi-gloss black air-drying enamel may be used solely to prevent rusting in shipping, in storage and during the first few years of service. Here a dry film thickness of .5-mils (½-mil) is cus-

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Stripping the so-called super paints was unnecessarily costly and time-consuming. Detrex met this *challenge* by developing strippers that work faster, more efficiently, more thoroughly.

Now Acrylic and Epoxy paints can be stripped in minutes instead of hours. Valuable time can be saved by reprocessing needed parts the same day.

Regardless of your paint stripping method — Detrex can assist you in speeding your operation and reducing over-all costs. Why not talk to a trained Detrex field representative now? They welcome the real "toughies".

SUPER ACRYLIC PAINTS
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Box 501, Dept. IF-660, Detroit 32, Michigan

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What factors will influence a wise decision on how much film thickness, of a specific coating, is needed or should be used on your products to give satisfactory protection and an attractive appearance.

tomary and adequate for the purpose. Similarly, shop coats or base coats designed to be covered at a later date fall in this same category.

To Resist Chemicals, Abrasion; To Provide Hiding Power

On the other hand, a piece of chemical equipment may require multiple coats of a vinyl resin to build up a thickness of as much as 7.0 to 9.0-mils. These are the extremes however. The average metal primer runs between .5 and 1.0-mil and the average topcoat is 1.0 to 1.7-mils. The precise amount is dependent upon a number of factors.

Some colors require relatively heavy thicknesses. A white or yellow enamel, for example, has such inherently low hiding that a film in 1.0 to 1.3-mil range would not have sufficient opacity to completely hide bare metal. Since one of the primary purposes of finishing is to impart a uniform color, such a condition is intolerable. On the other hand, a black, medium-to-dark gray, dark blue or green—these colors have such good hiding power that a thinner film can be tolerated.

Sometimes a large number of inexpensive pieces, such as toys, are being produced and the paint cost is a significant portion of the unit cost. Here the use of medium to dark colors, particularly by dipping, will allow a film in the .9 to 1.3-mil range to be advantageously employed at a minimum cost.

Gloss, Flow, Build and Appearance Factors

However, such aesthetic qualities as gloss, flow and "build" are of importance too. To illustrate, a manufacturer of expensive X-Ray machines desires the utmost in appearance for his product. Not only does he use a primer coat but he follows this with two coats of enamel to build up a film which is close to 3.0-mils in depth. The result justifies his extra expense, which still amounts to less than 1% of his cost.

Appearance, then, is one of the basic factors involved in determining the proper film thickness for a specified product. A film thickness in the 1.4 to 1.7-mil range definitely shows better gloss and fulness, and it doesn't have the skimpy, "starved" effect which is characteristic of an excessively thin film. Since the cost of the finish, in most cases, is only a very small percentage of the unit cost, it follows that it is false economy to skimp on the paint film.

Hand Spraying May Leave Thin Places

In this connection, it is well to remember that the application of a hand-sprayed coating involves a mechanical operation wherein the human factor of error is always present. Accordingly, it is prudent to apply more than the minimum

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RANSBURG

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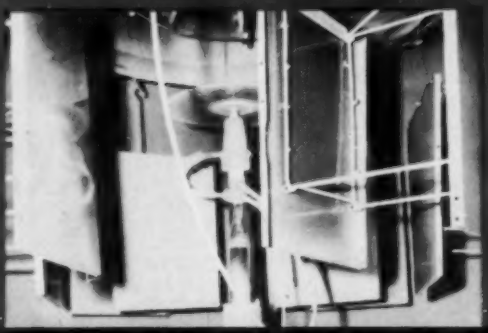

RANSBURG NO. 2 PROCESS

Kelvinator Division of American Motors switched from hand spray to RANSBURG No. 2 PROCESS Electro-Spray to meet increased production schedules . . . improve the quality of the finish . . . and lower finishing costs.

SAVINGS EXCEEDED EXPECTATIONS

Demonstration tests in the Ransburg labs indicated substantial savings in finishing costs, but in actual production, SAVINGS ARE EVEN GREATER than estimated. That's why Kelvinator is now considering RANSBURG Electrostatic Spray Painting for other products of their "white goods" line: Refrigerators . . . Home Freezers . . . Ice Cream Cabinets . . . Electric Ranges, as well as some components.

NO REASON WHY YOU CAN'T DO IT, TOO!

Want to know how Ransburg No. 2 Process can improve the quality of YOUR painted products, and at the same time, cut YOUR paint and labor costs? Write for our No. 2 Process brochure. Or, if your production doesn't justify automatic painting, let us tell you about the new No. 2 Process Electrostatic Hand Gun which can be used in either conveyorized, or non-conveyorized painting.

RANSBURG

Electro-Coating Corp.

Box-23122, Indianapolis 23, Indiana

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film to lessen the possibility of having those inevitable thin spots. The reduction in after touch-ups, reworks or rejections will usually justify such a procedure.

For Metal Protection A Primer Adds Value

The second basic factor involved is metal protection. Where exterior or unusual conditions of humidity or chemical attack are involved, an adequate film coating is a necessity. Frequently this involves the use of a primer. Primers are unique in that it is possible to incorporate metal protective pigments into them which it is not possible to add to topcoats. The resultant improvement in resistance fully justifies the added coat. Manufacturers of washing machines, for example, by utilizing unusual Epon or acrylic primers with special pigments are able to employ a two-coat system which will stand up to hot soap and detergent solutions for years; and this way they eliminate the necessity of using the more expensive porcelain enamel.

Abrasion resistance is another quality that demands a heavy film. Being an organic product, we know that when paint is subjected to repeated abrasion it will eventually wear down to the substrate. Faced with this problem, manufacturers of steering wheels solved it by specifying a baked finish which inherently has excellent resistance. They then apply this finish to a minimum of 3.5-mils and thereby achieve an average service life of ten or more years.

In short, the film thickness which is correct for your product can be ascertained by weighing the factors of quality, performance characteristics and cost. When such a figure has been determined, a periodic check with a film thickness gauge is in order. The regular use of this instrument can be expected to maintain a finished product which embodies the desired quality and performance at a known unvarying cost.

ADM to Build Chemical Center At Peoria, Illinois

Archer-Daniels-Midland Co. will build a multi-million dollar chemical center near Peoria, Ill. Ground will be broken for the new Chemical Center in late summer or early fall, with plant operations scheduled to begin in the spring of 1962.

ADM is one of America's 200 largest and most diversified industrial corporations with annual sales of nearly a quarter billion dollars. The company has been a producer of chemicals derived from vegetable, animal and marine fats and oils for 30 years and in recent years has placed increasing emphasis on this part of its business.

The Peoria installation will be one of the most modern of its kind in the country and the most versatile plant in ADM's chemical group.

Architect's drawing of Chemical Center to be built by A.D.M. Co. at Peoria, Illinois.

Is YOUR Plant Located Here?

Industrial finishers using solvents for thinning or cleaning, whose plants are located within the shaded areas on this map have access to APCO Industrial Naphthas—known throughout the industry for 35 years as the "UNIFORMITY" line. Here are some of the good reasons behind this reputation for uniformity:

- SINGLE SOURCE OF QUALITY CRUDE
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- CLOSE MANUFACTURING CONTROL

APCO offers the services of its technical laboratories and experienced sales force. Get acquainted now with your APCO Solvents man. His name will be supplied upon request.

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NO. 10 MINERAL SPIRITS
DRYOLENE

Other solvents to meet specific needs

APCO
INDUSTRIAL NAPHTHAS

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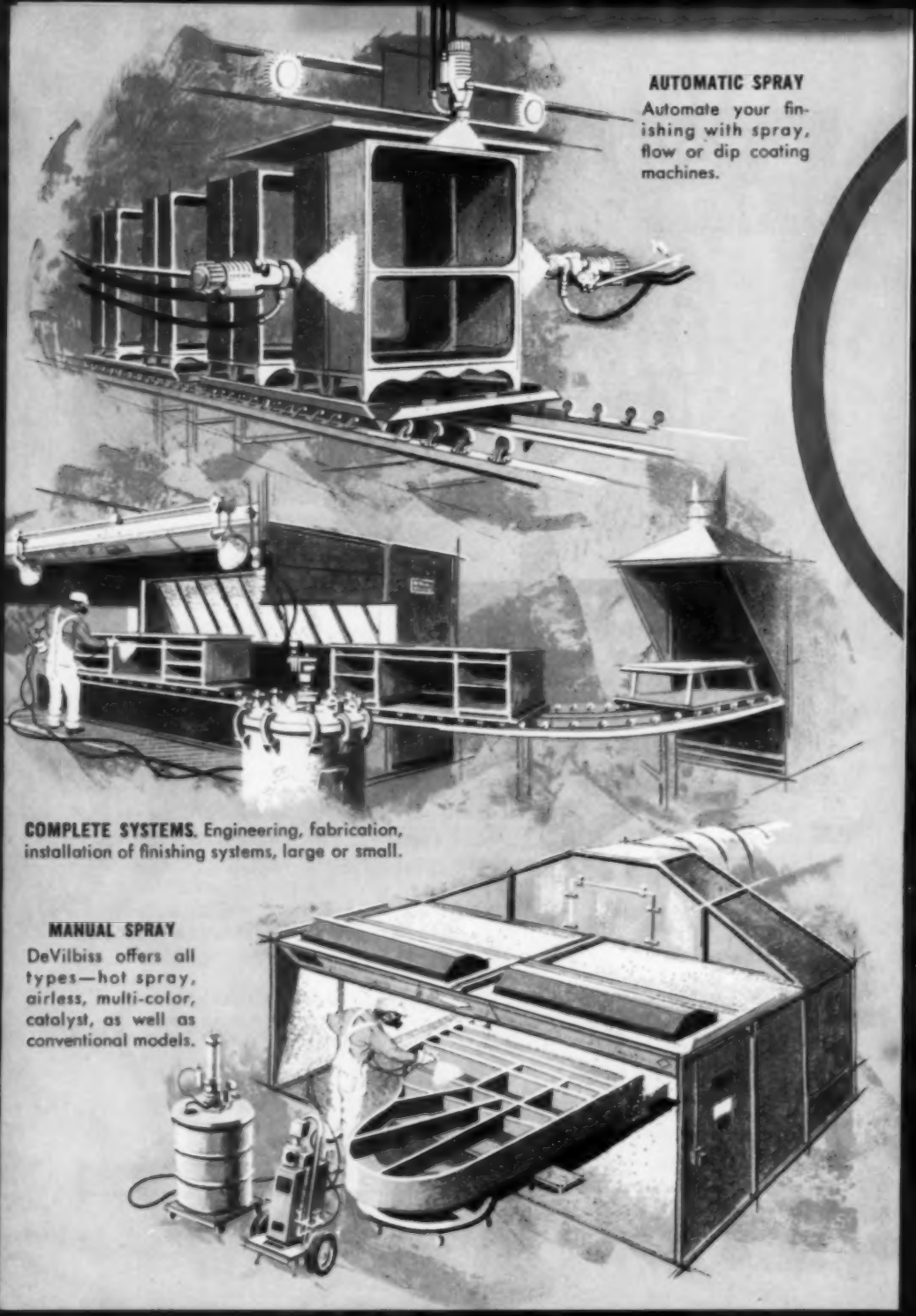

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Automate your finishing with spray, flow or dip coating machines.

COMPLETE SYSTEMS. Engineering, fabrication, installation of finishing systems, large or small.

MANUAL SPRAY
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DeVilbiss total service

can determine the right method for you

WHETHER you need an individual spray gun, dip tank, parts washer, oven —or a completely integrated system— DeVilbiss is the one company that manufactures them all. And they're backed by services that ensure your getting the right application equipment for your coating or finishing job.

Trained personnel provide engineering service, cost estimates, system layouts.

Our customer research laboratory in Toledo will conduct a free test run on your product using materials you use in production.

Production Service. DeVilbiss engineers will study production conditions in your finishing department and make necessary recommendations. DeVilbiss will also help train your personnel.

This is how DeVilbiss total service can determine the right method for you. Just contact your DeVilbiss representative. The DeVilbiss Company, Toledo 1, Ohio. Also Barrie, Ontario; São Paulo, Brazil; London, England. Branch offices in principal cities.

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Painting Heavy Pumps

By Frederick Wolf
Supt., The Gorman-Rupp Co.*

OUR PAINTING problems don't involve great speed nor frequent repetition. In other words mass production, as such, doesn't exist in our painting department. We want a quality finish —almost a custom finish—with as little labor as possible. We think we have developed several ways of doing our work which might interest others who paint bulky objects.

For the record, Gorman-Rupp pumps, "Unsurpassed for Pumping Fast," have become a by-word in industrial and commercial applications for nearly three decades. We have met many specifications for the military and count the U. S. Government as a good customer. But the uses of our pumps are so diversified they almost defy tabulation.

This series of stainless steel cleaning and surface treating tanks is set up for cleaning and preparing aluminum pump castings for painting.

Custom Painting; Many Colors; Small Batches Mixed at a Time

As I said, painting these pumps is not an assembly line job. We might do a few dozen (or even more) of one type of pump at one time, but for the most part you'll find an odd assortment of sizes and shapes going through our paint booths in any ordinary day's routine activity. This means that we may have a number of different colors of paint to handle in a day's time, in different batch sizes, too.

We have used the simple expedient of having different sizes of containers or paint tanks for holding paint. These vary from a quart size or smaller to tanks holding as much as five, ten, twenty or more gallons. And there is the equally simple factor of buying paints, mostly in comparatively small containers such as gallons.

Painters mix their enamels with thinner in preparing the batch or

*Mansfield, Ohio.

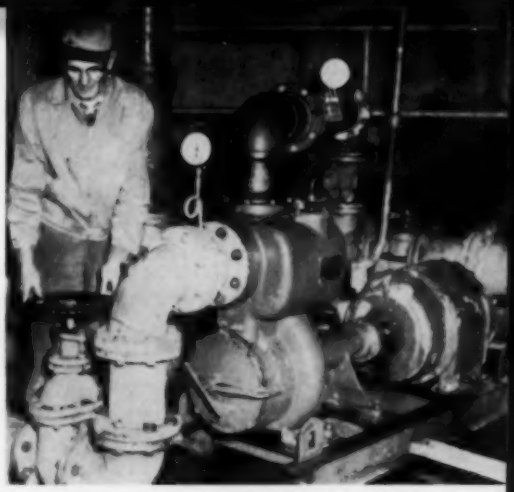
quantity of paint needed. This is about as efficient as you can be, with our practically custom painting work. We keep a weekly inventory going on paints, by the gallon, so that no customer will be neglected. Diversity of customers and their preferences in colors demands that we keep about 25 colors, plus thinners, on hand at all times.

Of course, we have a Gorman-Rupp blue (we think it is our own distinctive shade, arrived at after some study and paint development) which goes on run-of-mine production jobs of pumps. We keep a considerable quantity of this GR blue "on tap"; but variety of colors, such as yellow, green, aluminum and cream are the rule here.

Surface Preparation Before Painting

What about preparation of the pumps before painting? We have the usual degreasing process, employing trichlorethylene for many castings and fittings before assembly. We follow with a careful hand-wiping of assembled pumps (with engine) before the products move to the paint booths. Masking is done at this stage; also, just prior to painting.

Before leaving the cleaning of pumps prior to painting, we might note one special setup we made in order to meet U. S. Government specifications on the cleaning and preparation of aluminum castings for pumps before painting. We had fabricated for us a series of four stainless steel tanks of about 350 gallon capacity each; they comprise



Gorman-Rupp pumps serve many treatment plants, like this one at Canton, Ohio.

a "line" beginning with an acid cleaning at a temperature of about 150° F.

The initial dip of aluminum castings in a stainless steel basket is followed by a cold water rinse; then another chemical bath similar to phosphatizing, and finally a bath in what we term a chromatizing solution. The first dip we mentioned lasts about six minutes; the other dips are of momentary duration until the chromatizing, which can be varied according to the penetration desired on the order. This "line" produces a treatment similar to anodizing.

Spray Booths; Air Hoist Turntable; Exhaust Fans

Our paint spraying facilities show some attention to the bulk handling problem. Probably the most spraying is done in a booth about 8-ft. across on the front side, with an exhaust fan at the back. Work is fed to this booth two ways —down a roller conveyor for small

to medium size pump assemblies, and from a skid or pallet with the help of a power hoist and jib crane, for the larger pumps. Pumps are supported on a turntable which is rotated by hand during the spraying process.

One of our newer spray booths is about 10-ft. square; it can be completely enclosed, with fumes and overspray being exhausted upward. It has an air-powered hoist cylinder and piston that raises a floor-level turntable, after it is loaded with a large pump. These heavy pumps are brought into the spray booth on a pallet, by fork truck or hand truck.

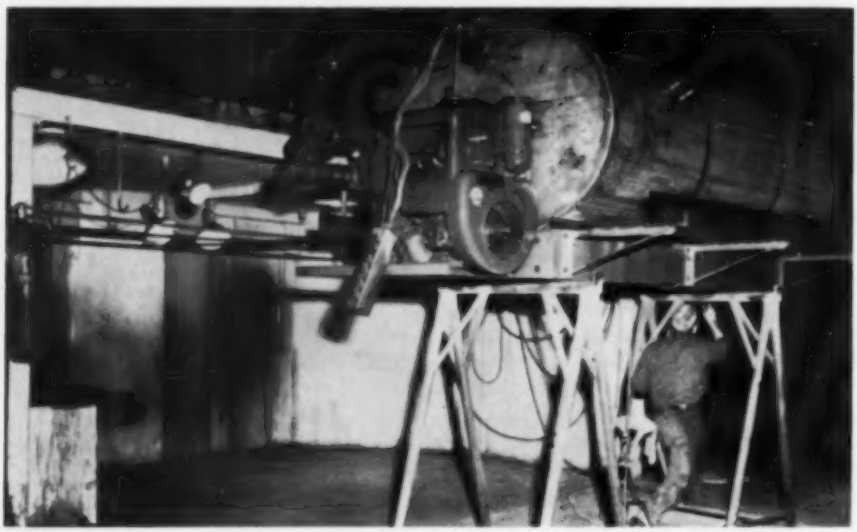
Excellent Lighting is a Must in Spray Painting

The large spray booth has safety fluorescent lighting on the sides and near the floor. There are also lights aimed from the ceiling and aimed from corners of the booth. With a bulky pump so positioned and lighted, the paint sprayer has the maximum opportunity to do a creditable painting job.

Several different sizes of pumps, a variety of colors, a quality finish, and short runs of each—these factors enter into the routine of product painting in this factory.

Finally, the biggest painting job in the plant concerns that of our OSC (Odorless Sanitary Cleaner) units for cleaning septic tanks and similar installations. These units weigh hundreds of pounds and re-

Huge OSC tanks with pumps, for cleaning sanitary or septic tanks, are supported in elevated position while the operator spray paints the under side.



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NEW—cleaning/phosphating process—FOR TANKS!

Now, by the tank-immersion method, you can get cleaning/phosphating efficiency comparable to pressure spray washing—with new CrysCoat 187.

This remarkable Oakite CrysCoat formula does two jobs in one. Its special detergent and solvent action removes a variety of smuts and shop soils . . . then CrysCoat 187 converts steel surfaces to a dense phosphate layer that walls out rust . . . bonds paint tightly.

CRYSCOAT 187 SAVES YOU TIME. It cleans and phosphates soiled parts in three to ten minutes. No time lost in mixing powders, either, because CrysCoat 187 comes in liquid form. Too, pH control is maintained quickly, easily.

CRYSCOAT 187 SAVES YOU MONEY. Gives you smoother iron phosphate coatings, calculated to soak up less paint than coarser phosphate layers. Solution life is longer, too.

CrysCoat 187 is the latest member of an entire family of Oakite CrysCoat processes. Each is designed to fill your special requirements. Ask your local Oakite man to "job-match" a CrysCoat material to your needs. Or send for FREE bulletin. Write Oakite Products, Inc., 20 Rector Street, New York 6, N. Y.

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SCIENCE
50 years' leadership in industrial cleaning

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semble somewhat the bulk gasoline trucks with which everyone is familiar today. Here it is a matter of elevating the pump and tank as-

Small and medium size pumps are mounted on a turntable and painted in a spray booth. They are usually moved into position from a gravity roller conveyor at the left.

sembly on supports about as tall as a man, so that some of the spray painting can be done from underneath. Then the assembly is lowered and moved into a spray booth, which is about 14-ft. across, for painting all around the unit. Handling is done with an overhead button-controlled hoist operated by the individual workman.

In the case of a large OSC painting job, spot lighting as well as flood lighting is employed. Here again, we are not so much interested in speed of painting as we are in getting the job done well. Needless to say, much of the cleaning of the OSC unit is careful hand-wiping with thinner.

Basically material handling is not productive; it adds nothing to the worth of the finished product or commodity, but it adds to the cost.

One of the major programs carried on at the new Enthone research laboratory is the development of corrosion inhibitors. Here a batch of test strips of various metals is being treated with a new experimental inhibitor. Each test strip is dipped in the inhibitor, laid out to dry and then carefully examined. Photo, courtesy of Enthone, Inc.

Midland Executives Move Up

Midland Industrial Finishes Co., Waukegan, Illinois, announces promotions for two of its executives. Mr. Edward J. Bromstead becomes Supervisor of the Metal Decorating Laboratories Division; and Mr. Richard E. Caplan moves up to be Supervisor of the firm's Product Development Laboratories.

Edw. J. Bromstead and Richard E. Caplan.

Research
man
at work

please turn the page quietly...

A test paint sample is inserted in the weatherometer, which produces accelerated weathering effects. This test provides data on fading, pigment chalking, blistering, cracking and wetting and drying.

In the Resin Research Laboratory, a test resin is prepared in a cooking apparatus. After the formula is completed, the newly developed resin is sent to another department for further testing.

A new primer coating that's been developed for galvanized steel sheet applications is demonstrated in the Technical Services Laboratory.

The Midland Industrial Finishes Company stresses the ability to develop specialized coatings for difficult or highly technical applications. Look in any one of Midland's nine laboratories: Analytical Testing, Metal Decorating Research, Container Research, Product Development, Technical Service, SICON Research, Resin Research, Dispersions and Quality Control. In the labs, chemists and chemical engineers work on specific customer problems and develop new and improved types of coatings.

Midland's research staff knows how important it is to use top-quality chemicals to get accurate results, assuring customer satisfaction. Chemicals must be reliable, that's why Midland uses USS Toluene. This high quality, nitration grade toluene stays uniform and has a high purity analysis. It meets *all* the rigid specifications required in research and development, as well as final production.

USS TRADEMARK

TOLUENE . . .

the start of a good finish

Nitration grade TOLUENE from United States Steel is the quality material that helps the research chemists at Midland Industrial Finishes Company produce quality coatings . . . USS TOLUENE assures you quality in your product, too.

Reactions of coatings to humidity and salt spray are determined in the salt fog machine. Test panels are subjected to continuous mist until coating fails or acceptable limits are passed.

Comparison of Seven Hot Spray Lacquers

BY HENRY G. KNAF
with Titanine, Inc.

SOME TIME AGO a customer turned over to us seven different 1-gallon samples of hot spray lacquers for wood. They had been submitted to him by seven competitive makers of wood finishes. Among them were some of the largest and most widely known companies in this business.

The customer lacked the facilities, as well as the know-how, necessary to carry out reliable and comprehensive tests. He prepared seven pairs of 7-ply mahogany panels each 8x12-in., and each having a moisture content of 7½%. They were filled after a washcoat and had received a sealer coat which was lightly sanded.

Comparison of 7 Lacquer's Solids and Viscosities

Table I shows the solids contents and viscosities in poises of the seven lacquers, which have been labeled *A, B, C, D, E, F* and *G*.

Examining these figures, one is struck by the wide range of solids content; they range from 26.9% to 32.8%. But more surprising is the range of viscosities from .86 to 5.10-poises. There is no correlation between solids and viscosities, that is, high viscosities do not go together with high solids, and vice versa.

Comparison of Their Spray Characteristics

None of the submitting companies had given any instructions about the temperatures at which their lacquers should be sprayed, so it was decided that 150° F. at the gun should be used for the test on spraying characteristics.

If the seven lacquers are ordered by their values of viscosities, the picture looks like this: .86, 1.08, 1.44, 2.15, 2.70, 3.17 and 5.10 with 2.15 as the median viscosity for the group. [*Continued on page 40*]

Table I—The solids content and the viscosity of each of the seven different lacquers.

Lacquer	A	B	C	D	E	F	G
% Solids	26.9	29.7	27.0	32.8	31.3	28.5	30.0
Viscosity	2.15	2.70	1.44	.86	1.08	5.10	3.17

With such wide divergence in viscosities one could expect that the spraying characteristics would also vary widely. Indeed they did. In fact, only the three lacquers *C*, *A* and *B*, with viscosities 1.44, 2.15 and 2.70—the three center items in the line-up of viscosities—could be sprayed satisfactorily, even though lacquer *B* could stand thinning.

The two lacquers with viscosities of 3.17 and 5.10 broke up badly, tended to dry spray and bubbled heavily with flow rates of about two pints per minute as required by the customer. The other two lacquers, with viscosities of .86 and 1.08, did not permit the application of film thicknesses on vertical surfaces of 1.25-mils, as was also required by the customer.

The lacquer required by this customer was supposed to be water white. The initial colors, as measured with the Hellige meter, ran as follows:

Lacquer	A	B	C	D	E	F	G
Reading	3+	2	2+	4	3	2+	—2
Solids	26.9	29.7	27.0	32.8	31.3	28.5	30.0

Table II—The initial colors as measured with the Hellige meter, a device used for the comparison of color of transparent liquid coating materials such as clear lacquers.

The solid contents are shown here also, because one would expect that the initial colors of the lacquers would be influenced by the solid content. This seems to be borne out by lacquer *D* which has the highest solid content and the darkest color. However, for the other six lacquers, no correlation seems to exist between color and solids.

After the lacquers were sprayed on the panels, using two coats with total film thicknesses between 2.5 to 3.0-mils, the panels were rubbed and polished and then exposed to an Ultraviolet Hanovia Analytic Lamp of 500-watts for one hour.

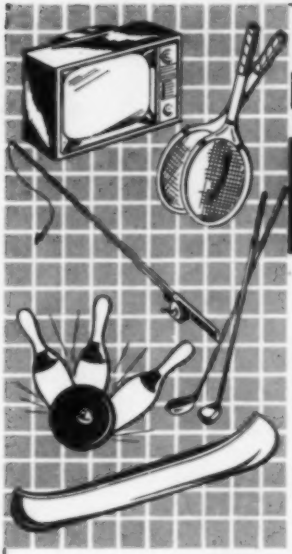
A ranking for the exposed panels was established by several judges. This ranking, after exposure to the U.V. lamp, corresponded exactly to the ranking of the lacquers as measured by the Hellige meter, namely: *G B F C E A D*. This is bearing out the belief that initial color of a lacquer is pretty much indicative of the degree of yellowing obtained by the U.V. exposure.

Toughness and Adhesion

The toughness test was carried out by pulling the edge of a dime over the surface under pressure, while the adhesion test was made by criss-crossing the surface with a sharp knife, with the cuts about 1/8-in. apart. The rankings in groups are shown in Table III with the best results termed "good" shown in the top row, with the middle position denoting "acceptable" and the bottom position "unsatisfactory". [*Continued on page 42*]

Toughness	Adhesion
DFE	BE
BCG	FD
A	GCA

Table III—Lacquers rated as to toughness.



Fun and...

Randolph Finishes

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Specially-formulated Randolph wood lacquers and clear or shaded synthetic coatings will make your sports products Look Better, Wear Longer . . and SELL FASTER!

Every sign points to a prospering economy in the 1960's. That means more money, greater leisure and more fun for sports-minded Americans. Let Randolph create for you the exactly-right finish to give zip, sparkle and irresistible appeal to your sports items.

RANDOLPH CAN FURNISH

you with the exactly-right finish for your product! There's no obligation—write for complete details to:

Randolph **PRODUCTS COMPANY**
CARLSTADT, NEW JERSEY

DOPES • LACQUERS • ENAMELS • THINNERS

For more data, circle 168 on colored card.

[*Continued from page 40*]

No correlation seems to exist between the two sets of rankings.

Cold Check Testing by Cycles

The last tests made on the panels were cold check tests. As mentioned before, there were two panels for each lacquer. Film thicknesses—very important for cold check tests—were between 2.5 and 3.0-mils before rubbing. After rubbing they can be said to range between 1.5 and 2.0-mils.

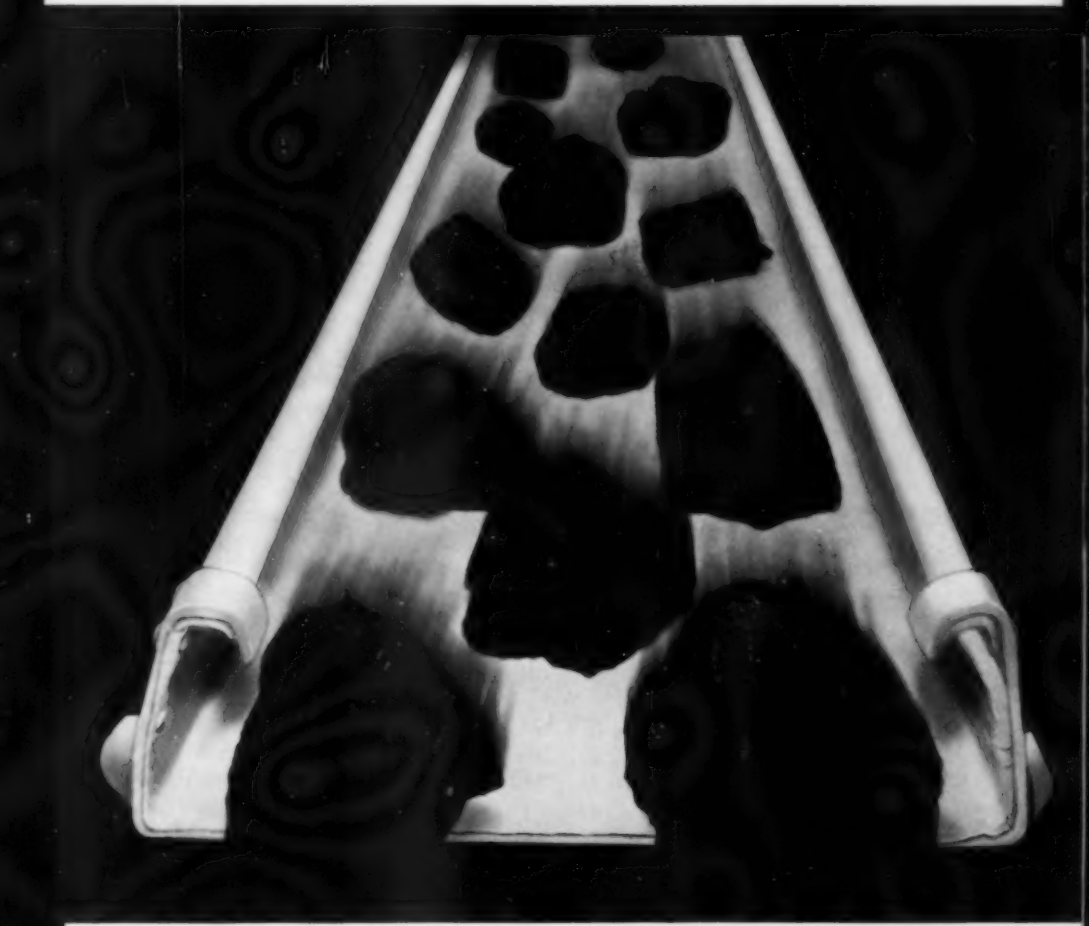
The backs and sides of the panels were sealed with lacquer sealer and the sides were covered with masking tape. The panels were exposed for one hour at 120° F., followed by a 15-minute cooling off period; then they were exposed for another one hour period to a temperature of 5° below zero, followed by another 15-minute period for observation. Thus one cycle comprises a time period of 2½ hours.

The results are shown separately for each panel; there was a pair for each lacquer. Also shown is the number of cycles when "signs" of failure first appeared and the number of cycles at which final failure (at least three significant breaks) took place.

As seen from Table IV, the cold check tests show a wide divergence in the results. While two lacquers (*A* and *E*) remained intact when

Panel	Signs	Failure	Test Stopped
A 1	None	None	46
A 2	None	None	47
B 1	35	40	
B 2	28	30	
C 1	None	18	
C 2	None	21	
D 1	21	23	
D 2	21	24	
E 1	49	None	49
E 2	None	None	47
F 1	3	5	
F 2	2	5	
G 1	None	26	
G 2	None	22	

Table IV—The first column identifies the panels, two of each coated with one of the seven lacquers, A, B, C, D, E, F and G. The second column indicates the number of test cycles made before the first sign of failure appeared. The third column shows the number of test cycles made when failure appeared (at least three significant breaks).



You can chute the works on Glidden finishes

Imagine finishes for metal products which can withstand the pounding and grinding action of a ton of coal rushing over their surface!

Coal chutes do not, of course, require a paint finish. But Glidden has developed and test-proven finishes which can take punishment under almost any conditions.

Glidden formulations are available to meet your particular requirements against unusual conditions of impact, humidity, heat, cold, corrosion, as well as abrasion.

Your Glidden salesman can give you full information on the best Glidden metal finishing system for your particular product or products.

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900 Union Commerce Bldg., Cleveland 14, Ohio

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No matter what your product, process or problem, Glidden Finishes plus Glidden Technical Service can provide the answer.

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approaching 50 cycles were the tests were stopped, one lacquer (*F*) had broken at five cycles. The remaining lacquers all show satisfactory resuts. Most customers will be satisfied with lacquers that stand up under a cold check test for 12 cycles.

Summary of Results

As we start going over the results, we can definitely rule out lacquer *F* on two counts, namely: Unsatisfactory cold check resistance and unsatisfactory spray characteristics, as seen from its high viscosity of 5.10-poises. If this lacquer were thinned down to obtain, let us say, a viscosity of 2 to 2.5-poises, its solids would have been reduced to less than 25%.

Since the customer was stressing water whiteness, we shall look at the color retention test. With lacquer *F* out of the running, there remain three lacquers, namely *B*, *C* and *G*. They have a good initial color (Table II) and were found to have good color retention after U.V. exposure.

When examining the spray characteristics of these three lacquers, we notice that *C* has the best spray characteristics of the three; *B* can be brought to spray quite well by a little thinning. Even *G* can be made to spray satisfactorily by reducing its viscosity of 3.17 poises to 2.0 or 2.5 poises without reducing its solid content too far below 30%.

If we now examine Table III showing the ranking of the lacquers for toughness and adhesion, we find lacquers *B*, *C* and *G* ranking as "acceptable" as to toughness while for adhesion *C* and *G* are unsatisfactory and *B* alone ranks as "good".

This would eliminate *C* and *G*; *B* remains as the only acceptable lacquer.

Final Remarks

It is hoped that the comparison of seven hot lacquers, shown in the foregoing, points up some of the difficulties a customer may face in choosing the proper material for this job.

But we hope it also can serve as a lesson to the makers of hot lacquers. When submitting the hot lacquer samples to a customer, the supplier must be aware of the fact that hot lacquers are to be ready for use without requiring any thinning. For instance, lacquers *F* and *G* (see Table I) should not have been submitted. Neither should *D* and *E*, with their very low viscosities which would not permit the building up of sufficient film thickness on vertical surfaces.

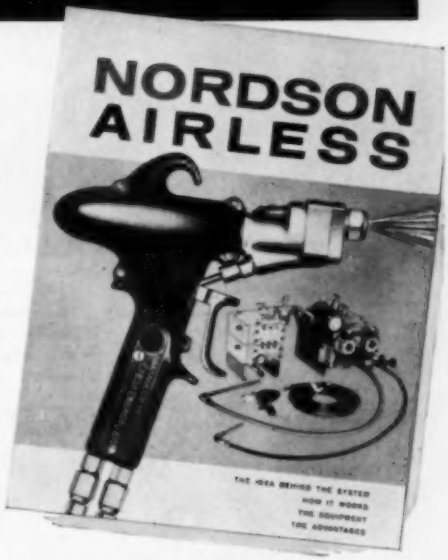
Lacquer *F* (See Table IV) should have never been submitted because of its low cold check resistance. Those lacquers that show shortcomings as to color retention, toughness or adhesion indicate that perhaps some manufacturers of wood finishes are not making the proper effort to bring their products up to the standard required by most of the manufacturers of finished wood products.

Basic problems do not fade away when unattended but rather thrive best when ignored and obscure. When allowed to go unattended, basic problems ultin ately become so crucial that they start erupting.

if you spend more than $100 per week for paint or other coatings, you should...

find out about

NORDSON HOT AIRLESS SPRAY PAINTING



The Nordson Hot Airless System can save you up to 30% on paint or other coating materials and on labor too! Less expensive spray booths and exhaust systems are needed. Clean up and housekeeping costs are reduced and at the same time finishing quality is improved.

Find out how Nordson Hot Airless can pay off for you, in savings and in improved quality. Write today!

NORDSON CORPORATION
55 Jackson St., Amherst, Ohio

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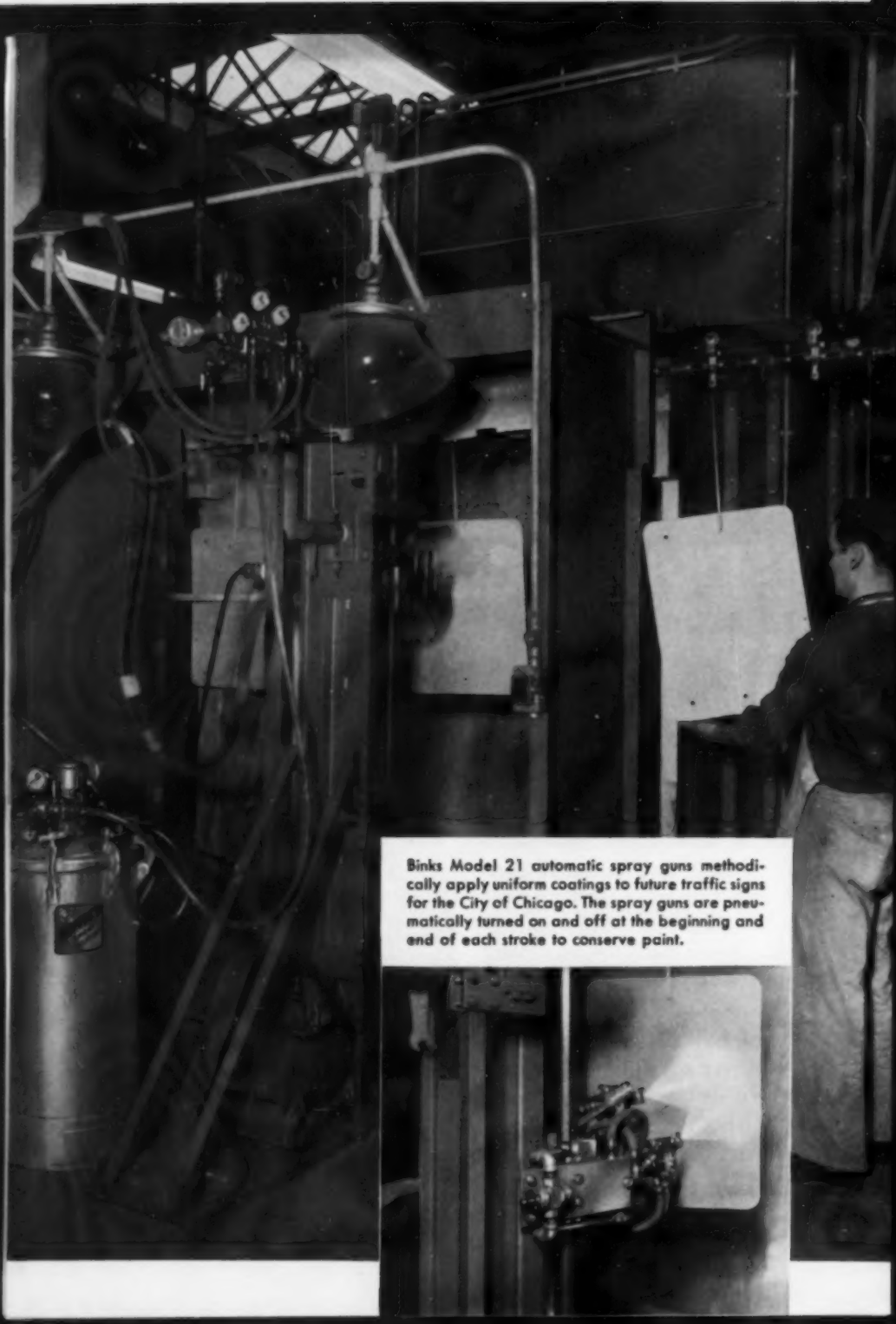

Binks Model 21 automatic spray guns methodically apply uniform coatings to future traffic signs for the City of Chicago. The spray guns are pneumatically turned on and off at the beginning and end of each stroke to conserve paint.

Chicago's Sign Division

cuts painting time from 2 days to 1 hour

"With our old equipment and air dry paints, it took us two days to paint a sign. With Binks automatic spraying system and drying ovens, we now do the same job in only 1 hour," states Mr. Don R. Crowell, City of Chicago Traffic Engineer.

Quality finish boosts sign life

Until Binks equipment was installed, many of the 100,000 signs produced each year had to be farmed out. Now all signs are painted in the Sign Division shop. Quality has been improved, too, since sign life is now about six years as against two years when painted by previous manual spray methods.

Saves time and paint

Besides a great savings in time, the new Binks system saves money by cutting the amount of paint needed through reduction of overspray. Although present production is 100,000 signs per year, the new Binks system can turn out up to 250,000 signs . . . an ample allowance for future growth needs.

Free planning service

If you have a spray finishing problem, it will pay you to consult a Binks spray finishing engineer. He will show you how a Binks integrated spray system can speed up finishing and give you better quality at lower cost. For an appointment call your nearest Binks office or write direct.

Ask for Bulletin 975 . . . describes spray finishing equipment, methods and systems.

Ask about our spray painting school
Open to all...NO TUITION...covers all phases

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Faster Finishing of Electric Conduits

AN IMPORTANT advance in the steel industry's increasing use of automated equipment has been achieved by Youngstown Sheet & Tube Co. Long one of the nation's leading producers of fine conduit, the company has recently increased its conduit production capacity more than 80% by the installation of a fully automatic conduit processing machine.

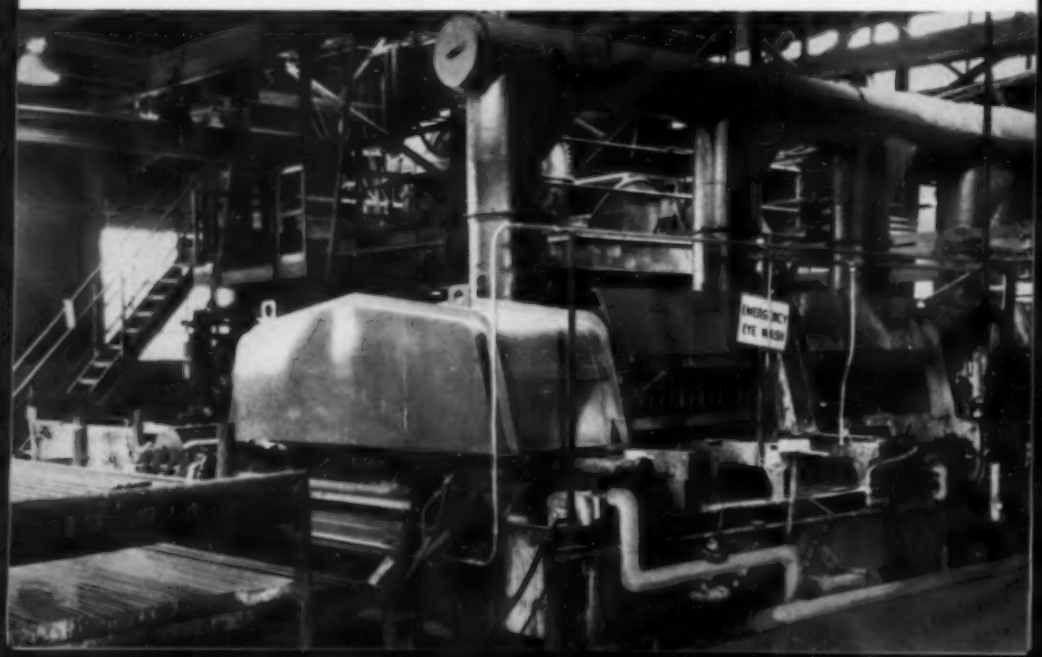
The new processing line reduces both the handling and finishing time, bundles tubing automatically, and paints both the inside and outside surfaces of the conduit.

Conduit Finishing Line is 325-ft. Long

The conduit line, designed and manufactured by a large concern in Matawan, N. J., is 325-ft. long; it cuts production time from five hours to less than one hour. As an added bonus, the conduit emerges from the machine with a lustrous galvanized finish instead of the dull finish previously produced.

The installation has a maximum production capacity of more than 1200 units of ½-in. EMT (Electro Metallic Tubing) per hour. As the

The 45-minute cycle begins. Tubing is carried into the line crosswise, one piece at a time, on an endless chain conveyor. Photograph, courtesy of Hanson-Van Winkle-Munning Co.



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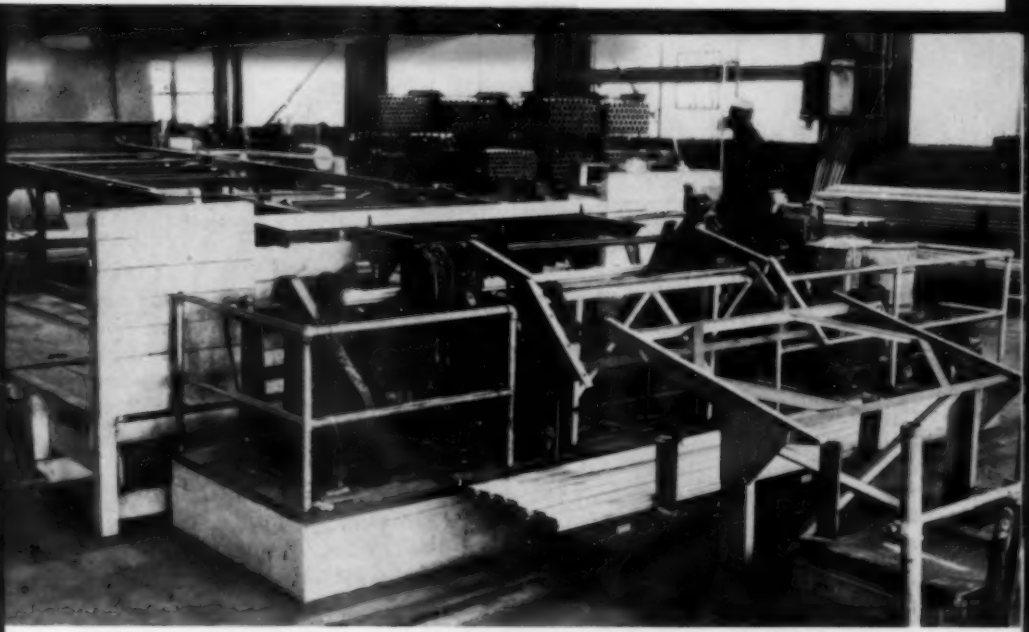


End of the conduit processing line. Bright galvanized tubing, painted inside and clear lacquered outside, comes out of the gas-heated dryer, rolls across the inspection table and is bundled automatically. Photograph, courtesy of Hanson-Van Winkle-Munning Company.

size of the tubing increases, finishing time is increased proportionately. While 20 units a minute are processed when the tubing diameter is only ½-in., for 2-in. tubing this rate falls to ten pieces a minute.

Tubing manufactured at Struthers Works is transported by overhead crane from the storage room and placed on a loading platform. Here the tubing is picked up, one piece at a time, by an endless chain conveyor and carried to the finishing line.

Conduit Line Layout; Operations in Process

The equipment consists of a series of cleaning, pickling and electrogalvanizing tanks arranged in a straight line. This setup enables each piece to move to the next operation or bath in a minimum length of time. Forty-five minutes elapse from the moment the conduit is picked up until it emerges as a finished product from the end of the line. The conduit travels at

What a lot of trouble and expense are involved in making our electrical conduit safe, almost indestructible, and attractive. And with all the processing, electroplating and brightening, it is significant that the inside surfaces of conduit are painted and the outside surfaces receive a protective coat of clear lacquer to keep those bright surfaces shining, even after long storage.

7-ft. a minute through the machine.

During the 45-minute cycle the tubing goes through the following operations:

1) Alkali soak cleaner.
2) Hot water rinse.
3) Electrolytic alkali cleaner.
4) Hot and cold water rinses.
5) Acid cleaner.
6) Two more cold water rinse baths.
7) Two electrolytic plating baths.
8) Two more water rinses.
9) A brightening bath.
10) Cold and hot water rinses.
11) Gas heat drying.

In the dryer, conduit is dried at a temperature of 300° F.

Once out of the dryer, the tubing is held for a few moments in a small supply hopper. A conveyor picks up five pieces of tubing at a time, out of the supply hopper. A hydraulic lift mechanism then raises the pipe from the conveyor to a spray painting position.

Insides are Spray Painted; Outsides are Clear Lacquered

A painting machine, carries five paint-filled pressurized spray nozzles inside the tubing. As the nozzles are withdrawn, the inside of the tubing is sprayed with paint. A few feet farther on, the outside surfaces of these five pieces of conduit are sprayed with quick-setting clear lacquer. After painting, the tubing is returned to the conveyor which discharges five lengths of painted conduit at a time.

The five pieces of conduit are picked up by another endless chain and carried into a gas-heated dryer where the temperature is 375° F. From here it goes into a 30-ft. cooling tower where forced air reduces the temperature of the tubing to approximately 120° F.

Rolling out on the inspection table, the pieces are checked by skilled inspectors who look over both the inside and outside finishes. Passed by the inspectors, the conduits are automatically stamped with the company's label and rolled onto a bundling table.

An operator, checking the number of pieces, presses a button and the automatic bundler wraps pressure sensitive tape around each end of the bundle. Bundles are lifted automatically out of the bundler and dropped into a pocket to be picked up later by an overhead crane and taken to the warehouse.

Solution Tanks; Power; Safety Features

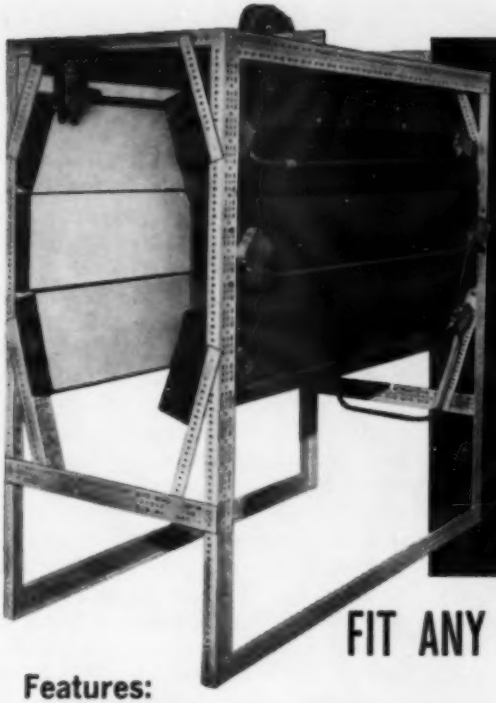
Liquid volume of all cleaner, pickle, zinc and rinse tanks totals approximately 32,000-gallons.

Solution tanks are made of steel or rubber-lined steel. Steel or lead heating coils, mounted in various tanks, are capable of heating solutions up to 200° F. Exhaust hoods remove fumes and float-operated valves are provided to maintain the proper solution level.

The source of power to operate this unit comes from nine remote controlled Germanium rectifiers ranging from 5000-amperes, 12-volts to 10,000-amperes, 9-volts.

Twenty-one motors, totally enclosed, ranging from 1-hp. to 60-hp. are furnished for driving, pumping and exhausting the equipment.

Exposed moving parts, such as couplings, V-belt drives, chain drives, etc., are protected by suit-



NEW RediRay® MODULAR INFRA RED OVENS

FIT ANY FINISHING SYSTEM

Features:

Uniform Heat . . . no hot spots; ceramic face emits even heat.

High Efficiency . . . no bulbs, tubes or reflectors to get dirty.

Low Maintenance . . . no bulbs or tubes to burn out or break.

Complete Flexibility . . . adaptable to any conveyor or system.

Now you can get infra red ovens tailored to suit your *special* finishing system at *standard* prices. In addition, RediRay's uniform, no-hot-spot heating . . . high efficiency . . . and low maintenance puts the profit dollars into *your* pocket. Free your finishing operation from costly, inefficient "fixed dimension" heating. Write us about your heating requirements. See how RediRay can save *you* money, too.

Free! Your copy of Engineering Data Sheet No. 112 describing RediRay and its applications.

INFRA RED SYSTEMS INC. 240 Route 23, Riverdale, N. J.

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able guards and covers to assure safe working conditions.

All tubing produced at the plant meets the rigid standards and the specifications of the Underwriter's Laboratories.

Editor's Note: A few questions may occur to some readers in reference to the several operations described in the foregoing article. We have asked these questions and have received answers as follows:

Q. 1) Are the surfaces of those tubes or conduits electroplated in No. 7 stage where "two electrolytic plating baths" are listed? And then further brightened in No. 9 stage, the "brightening bath"?

A. 1) The surface of the conduit is electroplated in two baths and then brightened at a later (No. 9) stage. Both plating baths are the same, but two tanks are used instead of one to reduce chain lengths and thereby reduce maintenance costs.

Some confusion may exist as to the reason for both plating and brightening the conduit. The two terms, in plating circles, are by no means synonymous. Plating refers merely to the deposition of metal on metal which can result, as in the case of zinc, cadmium and many other metals in a dull deposit which must be brightened in another kind of chemical solution—a bright dip.

Q. 2) If the surfaces are electroplated, why is the paint coating added?

A. 2) Electrical conduit must be painted on the inside to meet Underwriters' specification. Were it not for this requirement, inside painting would not be desirable or needed. Outside painting, actually a clear lacquering, is required by Youngstown and is regarded by them as a selling feature. Unlacquered conduit has a tendency to darken with handling and long storage, but the clear lacquered conduit keeps its luster indefinitely.

Q. 3) If the electroplated and brightened steel surfaces are painted, how does paint stick to those slick surfaces? It would seem that the surface would have to be mildly or lightly etched to make any paint stick to brightened electroplated surfaces.

A. 3) The brightening bath is an etch, and specially manufactured lacquers adhere to its surface quite readily.

Q. 4) Immediately after the outside surfaces of those conduits are painted but before baking, how are the conduits supported in such a way that some of the surface paint will not be scarred or rubbed off along the under (contact) side?

A. 4) The ends of the conduit are the only parts being touched during the transfer from the paint to the baking steps, and the small amount of paint that rubs off is barely detectable (see drawing).

Only ends of conduits touch tapered bearings during transfer from paint to baking.

Because the steel conduit is zinc coated, no corrosion can harm the unpainted surfaces. Further protection for the unpainted areas are supplied by the couplings that hold lengths of conduit together when in actual use.

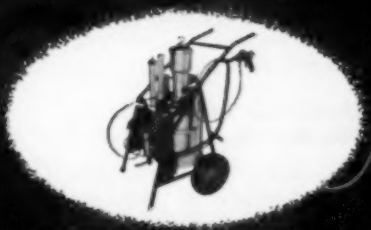
FOR AIRLESS
THE ANSWER IS

H GUN

Now you can spray for quality with Spee-Flo's new H-GUN*. Get top quality finishing with lacquer, varnish, enamel and oil base materials. Faster application and material savings average 40%!

The new H-GUN, operating from a conventional airless system, sprays a pattern with full-feathered edges and uniform material distribution. It may be used for wide or narrow patterns and even in small enclosures. It will not flood the surface or produce "pig-tails". If you know airless, you **know** this is news.

The design of the H-GUN permits lower operating pressures. You get longer spray tip wear and reduced equipment maintenance. All new HydraAirless 20 systems are equipped with the H-GUN. Or, you may add the H-GUN to your present Spee-Flo system. Ask for an on-the-job demonstration. See what the H-GUN can do.



HydraAirless 20 system mounted on new swing-level cart.

The SPEE-FLO Company

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SPEE-FLO CREATES A NEW ERA FOR AIRLESS.

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Using an eletrostatic hand gun to apply a clear protective coating to new brass Metalcraft furniture. The "wraparound" characteristic of electrostatic spraying makes it possible to completely coat the furniture while spraying from only one side.

Metalcraft Furniture Coated with Electrostatic Hand Gun

BRASS FURNITURE WAS introduced to the trade by George Koch Sons, Inc., Evansville, Indiana, about 12 years ago. The idea just didn't "take".

Again we tried in 1950, but the public still wasn't ready, and the furniture sold only in a small way. Then, three years later—with the help of interior decorators who had a lot to do with popularizing the use of brass in the home—the idea caught on. There's been a steady increase, year after year, and today 90% to 95% of our fine Metalcraft furniture is brass-plated. Biggest outlets are furniture and department stores; there's hardly a town in the country where you can't find Koch Metalcraft furniture.

Quality is Important on Metalcraft Furniture

Quality is all important in the manufacture of our products. In the first place, we use premium wire of plating quality. It's grease-drawn and requires no polishing as standard steel does. We use wire in eight different sizes, up to 7/16-in. in diameter.

Repeated tests on our new finish show it to be impervious to any material such as ammonia, alcohol and

The author (left) and Charles Harlow assistant superintendent.

By D. F. Nuebling, Supt.
George Koch Sons, Inc.

iodine, normally found in the home. The present epoxy finish has about six times more abrasive resistance than the dip lacquer we formerly used.

We have no brass plating facilities of our own; however we have three local firms doing our work. We do our own fabricating; we send the work out for plating; it comes back to us and we put on a protective clear coating.

Over Brass Plating We Use A Clear Epoxy Bake Finish

Formerly, we used a water dip lacquer for the protective coating. It was all right, but we decided to go to a bake finish to further improve the quality of our products. None of the platers had baking facilities, but we did have, so we easily converted what was formerly a cleaning line to a finishing line. Also, we went to electrostatic spray painting with the hand gun. We knew a little about electrostatic, for we have been using electrostatic detearing on our dip line for several years.

All in all, we have over 400 brass items, ranging in size from a 78-in. headboard for a bed to a small frame holder for a piece of pottery about the size of a tea cup. The latter is one of several hundred items we produce for the floral industry. Among the most popular furniture items in the brass line are vanity tables and benches, costumers, drum hassocks, straight chairs, rocking chairs, mirror frames, TV tables and whatnot stands.

Along with the brass-plated products, many pieces are still enameled. For instance, our tea wagon is available in black, white, pink and turquoise, as well as chrome and brass. Other products for the kitchen and bath are also enameled.

Electrostatic Hand Gun; Conveyor Line; Baking

Many of the products we make are short run items of various sizes and shapes. On all of the work, we strive for maximum coverage, and the No. 2 Process of electrostatic application gives us this desirable finish without sags and runs. Areas

that get exceptional wear—such as table edges and chair seats—are given extra film thickness for added protection. A time-saving feature is the "wraparound" of electrostatic painting which gives us a uniform coating over all areas while the operator is painting from one side only.

Our finishing conveyor line—385-ft. in length—operates at a speed of 9-ft. per minute; work is hung on the holders at 12-in. centers. One operator does the painting. After it has been coated the work travels into a gas-fired, overhead oven where the coating is baked for 19 minutes.

Loading station where furniture pieces are hung on workholders which are spaced at 12-in. centers on the conveyor line.

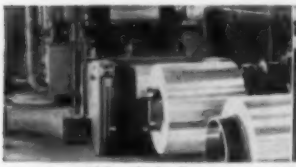
Metalcraft furniture, made of heavy steel wire and all brass plated, is given a protective coating of clear epoxy finish by spraying from only one side with an electrostatic hand gun.

Quality improvement was our main objective in changing to our present setup; however, there are other desirable features. Maintenance in the painting area is greatly reduced — and, although comparative figures are not available on all items, we are saving substantially on materials. We made a test run on an enameled TV table. It has two perforated trays and folding legs. Formerly we used 30 gallons of enamel to paint 1000 tables by combination dip and air spray touch-up. Now, with electrostatic hand spraying, we are getting out 1000 tables with only ten gallons of paint. In adidtion to saving two-thirds of the paint, we get a uniform high-quality finish with the electrostatic hand gun.

Infrared Ovens for Paint Laboratory Use

Infra Red Systems, Inc., 240 Route 23, Riverdale, N. J., offers Engineering Data Sheet No. 114, which shows an illustration and presents information about portable and adjustable infrared heating units, designed especially for use in paint laboratories.

Increasingly, paint manufacturers are being asked to give product specifications concerning drying or curing time in an infrared oven. Many paint companies have only convection oven data. This small infrared unit enables them to quote drying and bake-out time in terms of infrared heating.



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FOR SUCCESSFUL STRIP COATING . . . it's *GASWAY*

OVER 70 LINES NOW IN SERVICE THROUGHOUT THE WORLD

This is the pattern of success. *Over 70 strip lines now in service.* These lines are producing properly finished strip efficiently and economically. Gasway is the pioneer in designing, building and installing complete metal strip finishing lines. For nearly 15 years, Gasway has been building and installing complete strip lines that are still producing satisfactorily and economically.

When you select a Gasway installation, you aren't dealing in futures... you're *sure* of the proper design and construction to fit your needs. You save trouble and get into production faster with Gasway. All the trial and error is eliminated. Gasway's long experience has solved the difficult problems involved in strip lines, up to 40" or wider. *This means positive protection of your strip coating investment.*

With Gasway strip lines, you can be sure of success!

- SMOOTH METERED COATING
- UNBELIEVABLE PAINT SAVINGS
- SPEEDS OVER 100 FEET PER MINUTE
- BOTH SIDES AND DIFFERENT COLORS, IF DESIRED
- APPLIES MANY DIFFERENT FINISHES

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LOOK TO GASWAY FOR EXPERIENCE AND KNOW-HOW IN STRIP COATING

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Six ways you benefit by installing a DeBurgh finishing system

The complete DeBurgh System conveys your product through the entire finishing operation and delivers it to the shipping room door. Inspection, sanding, spraying, toning, drying, rubbing, upfitting and rework all can fit into a predetermined production schedule.

Recently, a complete DeBurgh system was installed at Craddock Furniture Co. Conveyor 1,690 feet long, winding through two floors. This system was complete! And it was completed in one week! On the eighth day this system was in operation!

Standard individual items . . . or complete systems . . . Koch has the facilities to provide for all your finishing requirements . . . designing, engineering, fabrication, supervision. How can we be of assistance to you? Drop us a line.

Your operation can be small or large. It can involve finishing products of varying size. No matter what your situation, the flexibility of the DeBurgh system enables us to adapt it to your requirements.

WITH A DEBURGH —

1. You'll do your finishing faster, with less labor, less fatigue.
2. You can save 50%, or even more, on finishing labor cost.
3. You'll increase your output. There's no lost time. Your labor is kept productively employed. It's not unusual for DeBurgh to pay for itself in 10 to 15 months.
4. You can save up to 35% in floor space.
5. You need make no costly plant alterations.
6. Your own maintenance crew can do the installation, can add to or alter your production lines as your finishing requirements change.

It costs you nothing to find out what DeBurgh Conveyorized Finishing will or will not do for you. You owe it to yourself to investigate. Drop us a line today. Ask for Data File **IF-606.**

GEORGE **KOCH** SONS, INC.

Evansville 4, Indiana

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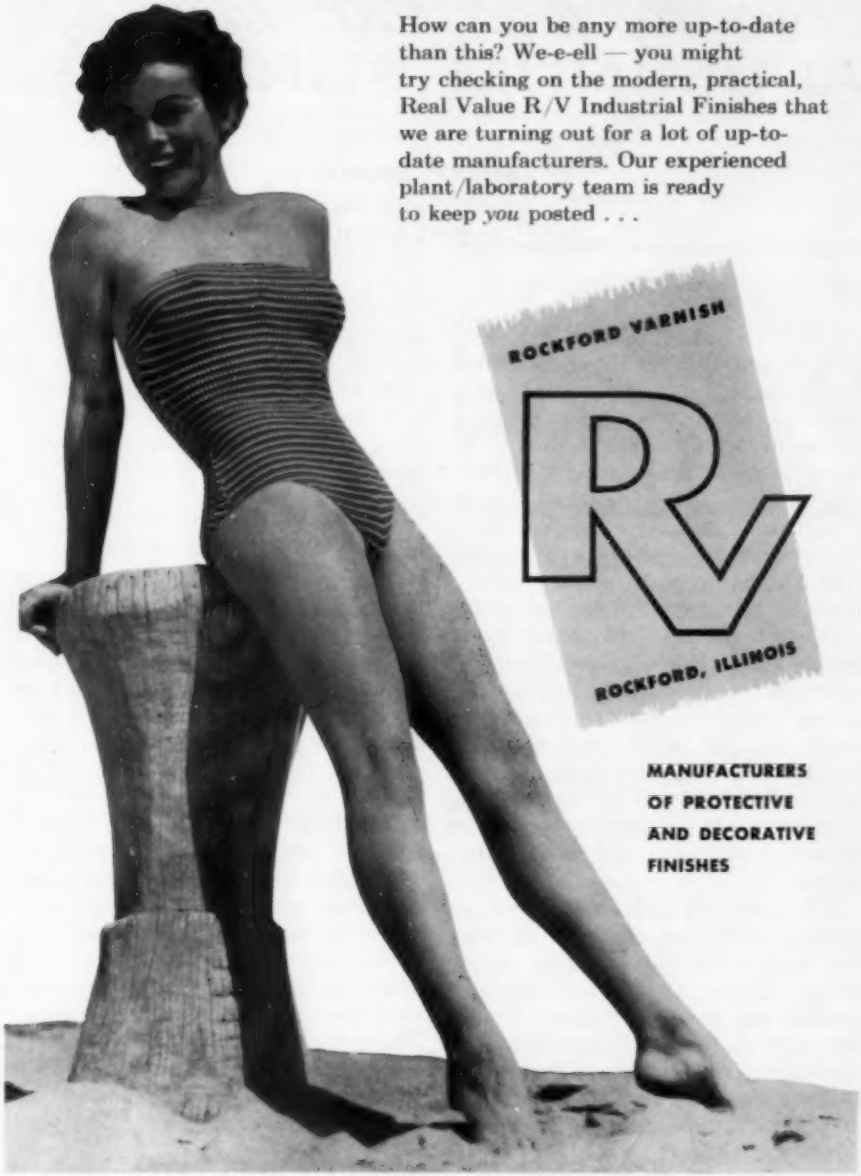

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Cleaning and Pre-Treating ALUMINUM SURFACES

By Lester F. Spencer
Centrifugal Pump Dept.
Allis Chalmers Mfg. Co.

ALUMINUM BASE alloys can attribute their increased usage, as an engineering material, to such desirable properties as favorable strength-to-weight ratio, relative ease in formability, inherent corrosion resistance and a natural attractive appearance. The corrosion resistance of these alloys, under certain service conditions, is based on the formation of a transparent and relatively inert oxide film. However, supplementary protective coatings may be required where the corrosive environment is likely to attack or destroy this natural oxide surface film. An added feature is that the surface appearance of the product may be improved and thus add to its sales appeal.

Although the technique used in coating aluminum surfaces is similar to that used in painting many other metals, the initial surface preparation may vary according to service conditions. For example, a decorative coating may require a surface that is free of oil, grease or other contaminants which might affect the adhesive qualities of the finish coat. On the other hand, a coating designed for protection against corrosion will call for a more elaborate pretreatment of the aluminum surface—probably solvent cleaning, chemical pre-treatment, priming and finish coat.

Cleaning Methods; Vapor Degreasing; Sandblasting

The simplest surface preparation procedure is that of solvent cleaning by swabbing or brushing, but this is the least effective and should be employed only where service conditions are not critical. The immersion method is more effective than hand cleaning but it is effective only so long as the contents of the tank are clean. A tank solution may easily become contaminated by a surface scum of oil or grease which may adhere to the work as it is removed from the tank.

Probably the most effective surface cleaning is vapor degreasing. The parts to be cleaned are passed through a vapor of heated chlorinated solvents such as trichlorethylene or perchlorethylene. The time of exposure is about 30 seconds, during which time the vapor con-

denses on the surfaces of the parts and the liquid streams off to wash the grease and oil with it. When heavy deposits of grease, oil or dirt are encountered, it is usually advisable to precede the vapor degreasing with preliminary hand or tank cleaning operations. Some degreasers are equipped with a flushing hose for this purpose.

It should be recognized that all types of oily contaminants cannot be removed by vapor degreasing since some of these materials tend to break down the solvents. There is also the danger of hydrolysis and the formation of hydrochloric acid if moisture is present. This emphasizes the need for periodic checking of the solvent to maintain reasonable efficiency.

Mechanical methods of surface clearing are sometimes used. These include hand and power wire brushing, and blast cleaning, especially for castings. Sand blasting of sheet metal parts is seldom employed due to the possibility of warpage.

Alkaline Cleaning Solutions; Phosphoric Acid Solutions

A practical method of cleaning aluminum surfaces is by spraying, brushing or immersing the work in an inhibited, mild alkaline cleaner. A solution concentration generally used is from 4 to 6-oz. of cleaner per gallon of water, with the solution maintained at a temperature of 160° to 190° F. An immersion time of 3 to 5 minutes is all that is required.

The alkaline cleaners are formulated to include emulsifying agents which increase the wetting action of the detergent and reinforce the saponification reaction. The wetting action of the detergent weakens the oil-to-metal bond, while the emulsifying agent breaks up the oil and grease into small globules and suspends these throughout the cleaning solution. If these oils and greases are of animal or vegetable origin, they become saponified and are soluble in water. Thus, the soap formed in this manner increases the emulsification and wetting power of the solution. Dirt is dispersed throughout the solution by collodial action, whereas the buffer addition maintains constant activity of the cleaner. A good cleaner will be formulated to soften hard water so that insoluble film deposits will not form on the metal surfaces being cleaned. In addition, a properly formulated cleaner should be free rinsing.

Aluminum surfaces must be cleaned and well conditioned to receive paint coatings, if one expects the protective or decorative coatings to really last under severe conditions.

A phosphoric acid type of solution is also widely used for the removal of light oxide films. This is an etching type of cleaner which leaves on the surface a thin inert aluminum phosphate film that tends to resist moisture penetration and to promote paint adhesion. One

formula consists of about 10% of 85% phosphoric acid, 40% of butyl alcohol, 30% of isopropyl alcohol, a small percentage of a wetting agent, and the balance water (U. S. Army Specification No. 98-20007).

Chemical Pre-Treatments for Aluminum Surfaces

There are several commercial chemical treatments for pre-treating aluminum. These include Bonderite, Alrok and the Alodine process. These coatings, when used as a base for organic finishing, leave a porous surface which is excellent for paint adhesion, thus increasing the resistance of the painted surface to any corrosive environment.

The Alrok process specifies immersion in a hot (150° F.) chemical solution for about 20 minutes. The pores of this oxide film are sealed by a subsequent immersion in a hot solution of potassium dichromate, after which the parts are rinsed. The absorbed dichromate neutralizes any residual alkali in the coating and tends to increase its protective power.

The Bonderite process specifies immersion in a Bonderite 170 solution maintained at about 190° F. for 3 to 4 minutes. A cold water rinse follows after which the parts being treated are dipped in a Parcolene solution operating at a temperature of about 175° F. The surfaces of parts should be thoroughly dry before being painted.

The Alodine process specifies immersion in an Alodine solution maintained at about 115° F. for one to two minutes. This is followed by a cold water rinse, a 30-second dip in a dilute Deoxylyte solution maintained at a temperature of 100° to 120° F., and then thoroughly dried.

Electrolytically produced oxide coatings are also used as a paint base. However, they differ from the chemical dip type treatments in that the coating thickness is a bit higher and the coating itself is harder, offering excellent resistance to both abrasion and corrosion.

Wash Primers; Two-Pack and One-Pack Primers; Baking

An alternate surface preparation method is a "wash primer." This prime type is basically an oil-free synthetic thermo-setting resin, as exemplified by the vinyl-butyral or ethoxyline type. Phosphoric acid is added just before use to render the resin insoluble; the subsequent reaction involving the resin, the zinc chromate pigment and the metal surface produces a hard and adherent base coat. Needless to state, a preliminary operation of vapor degreasing is required.

A two-pack primer, frequently referred to as the "reactive type" wash primer, must be mixed immediately before application. The coating is applied by spraying or dipping. Its baking temperature will vary from 350° to 600° F., during which time the above stated reaction occurs.

The one-pack primer, known as the "reacted stable" primer does not have to be mixed with each application. It is easy to apply and is less expensive than the two-pack primer. However, the adhesion and protective value of the one-pack

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CHAPTER TWO

The development of the Tousey Varnish Co. into a full-line paint company marks the second phase of its 75 year history. This building of the company to a position of substance in the industry rested largely with one man, William R. Alcorn, who joined the organization in 1908 and was elected president in 1924. Mr. Alcorn's business acumen led him to direct the company's primary sales efforts to the field of agriculture where manufacturers of equipment and machinery were expanding at an unbelievable rate.

As business increased Tousey added new buildings and equipment. Three laboratories were set up and staffed with technical directors and ample help.

Individual attention to customers' needs, dedication to the manufacturing of quality products and a sincere effort to maintain these standards continued to be Tousey's formula for expansion during the second period of its history.

(to be continued)

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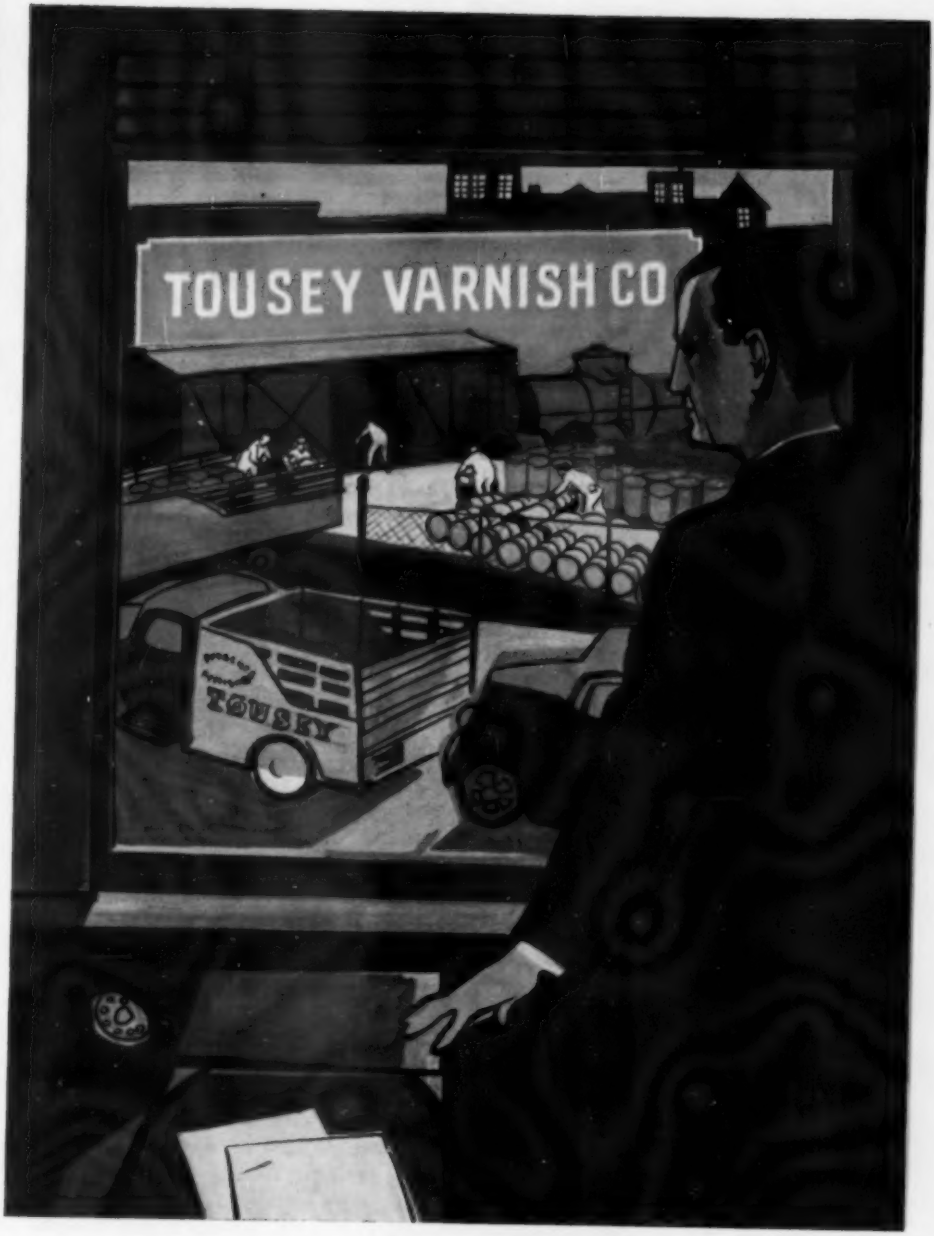
TOUSEY VARNISH CO
TOUSKY

primer doesn't rate as high as the two-pack primer.

The two-pack primer forms an adherent film by reaction with the metal surface which may be considered to be an inorganic surface conversion coating with an overlaying chemically bonded organic film. Since the two-pack primer is usually discarded 6 to 8 hours after it has been mixed, spraying is preferable to dipping. The coating thickness will be from 0.0003 to 0.0005-inch; this may be followed by either an anti-corrosive or priming coat. Evidence that etch primer coatings are flexible is shown in tests where sample test strips have been bent through an angle of 180° and elongated 2½% without visible damage.

Do not overlook the need of using a satisfactory sealer between dissimilar metals that are joined in assembly; this is to prevent galvanic action which promotes rapid corrosion.

Primers, or size coats as they are sometimes called, are suitable for use on aluminum. However the selection of the specific primer will depend upon anticipated service conditions. Characteristics of an ideal primer would include a maximum value in adhesion to the base, corrosion inhibiting properties, moisture resistance, flexibility and, above all, compatibility with the top coat. Of course, in order to select a primer on a practical basis, with both anticipated service and economics to be considered, it is frequently necessary to compromise. You take less of one feature to get more of another.

Pre-Cleaning; Anodizing; Zinc Chromate Primer

Where a high order of protection is required, it is customary to have a pre-clean, anodizing pre-treatment and a prime coat pigmented with zinc chromate. Where sea water and marine exposures are anticipated, a phenolic resin or an alkyd resin base may be chosen. This primer has excellent air drying characteristics; it is usually dry to handle in about five minutes. Parts coated with this primer should not be left in storage for a long time, since the paint film progressively polymerizes or hardens, which adds to the difficulty in obtaining good adhesion of the top coat.

More recently, the vinyl-base primers are being recommended for use over a "wash" coat. The vehicle is a vinyl resin and the pigment is usually a zinc chromate. This is then given a baked vinyl top coat. It has been stated that the vinyl base primers, when pigmented with aluminum powder, are especially effective for use on surfaces that will be in contact with sea water.

Clear and Tinted Primers; Primers as Sealer Coats

Clear or lightly pigmented primers are frequently used on aluminum. One example that comes to mind is the use of an unpigmented

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phenolic-base primer on washing machine parts to obtain both chemical and moisture resistance. Alkyd-base primers pigmented with white titanium dioxide are used extensively on electric refrigerator parts for adhesion and flexibility of the prime coat. Aluminum powder, or a mixture of aluminum and zinc powder in a synthetic resin vehicle, has also been used as a primer for special applications on aluminum base alloys. In fact many pigments, such as zinc tetraoxychromate, strontium chromate, ammonium ferrous phosphate and iron oxide, by themselves or in combination with zinc chromate, have been used on aluminum with good results. Pigments that contain lead should be avoided since lead may accelerate the appearance of pit corrosion.

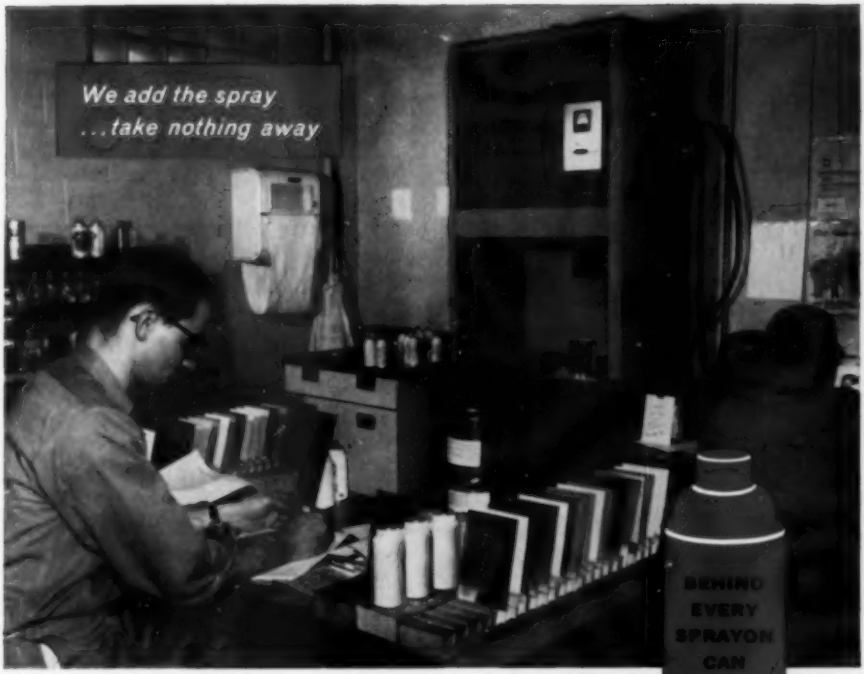
The application of a prime coat to serve as a sealer on individual parts of an assembly may be required, particularly where the aluminum comes in contact with a dissimilar metal such as copper or steel. The prime purpose is to prevent galvanic attack between dissimilar metals. This can be prevented by selecting two metals that are compatible but sometimes this cannot be done. The other alternative is to select a material that will exclude any moisture between the dissimilar metals. Typical applications, where a sealant would be employed, would be in the construction of seaplanes, trailers, boats, busses and railway cars, where the conditions of service are very severe.

Sealing compounds are usually of the zinc chromate type, ranging from 60% to 98% solids. Aluminum pigmented pastes are also employed. The use of impregnated, non-absorbent tapes are recommended partly because of their ease of application. The cloth supported type is not usually recommended since the cloth may act as a wick. Zinc chromate tapes are particularly effective although care must be taken when they are used. The precautions necessary would center on the pressure employed, making sure that cold flow does not occur during application of the tape. This is important in seams, since loose fastenings may result, with subsequent galvanic action. Care must also be taken to prevent any breaks, since pit corrosion may develop. Both sealing compounds and tapes, such as the Neoprene impregnated type, remain flexible or tacky for a long time—and in addition they have been known to be unaffected by low temperatures.

Final Finish Coatings; Lacquers, Enamels, and . . . .

Paint materials, such as lacquers, enamels and varnishes, are commonly used as final finish coatings. The popularity of this class of materials is understandable since there is such a wide selection from which a specific finish can be chosen to meet almost any type of service requirements. The three classes of materials within this category may be briefly defined as:

1) Lacquers which may or may not be pigmented. They are commonly designated as formulations of cellulose nitrate or acetate, combined with a plasticizer and a resin in a suitable solvent. [*To page 70*]



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2) Enamels, which are always pigmented. They consist of formulations that include a resin, a plasticizer and a solvent.

3) Varnishes are formulations that include a resin, a drying oil, a drier and a solvent. When the proportion of drying oil to resin is large, the term "long-oil varnish" is used.

Synthetic resins, as an addition to paint formulations, have increased tremendously in recent years. Of the thousands of synthetic resins that have been incorporated experimentally into organic coatings, many have found useful application. These resins have been derived from about a dozen families of which the most important include the thermosetting melamines, silicones, phenolics, ureas, urea-formaldehydes and the furanes, as well as the thermoplastic styrenes, nylons, acrylates, ethyl cellulose, vinyls and alkyds.

The excellent film-forming characteristics of cellulose nitrates and acetate lacquers, their solubility in a large number of organic solvents, and their compatibility with many plasticizers and resins—these factors have influenced the use of these materials for coating aluminum. They are reputed to be resistant to water and gasoline; however, they do not withstand salt water, alcohols or oils. Some of them have a tendency to become brittle and discolor upon exposure to sunlight. With the development of other type resins, and their subsequent incorporation into the cellulose lacquers, improvements have been made in adhesion, durability of the coating to various corroding environment, and stability.

Improved Types of Lacquer Have Desirable Features

Examples of improved lacquer types would include: 1) the phenolic resin addition to improve adhesion and to increase resistance to moisture, acids and alkalies; 2) the vinyl resins suitable for baking type lacquers, where chemical resistance is of prime concern; 3) the alkyds modified with either drying or non-drying type oils; they are employed in high-solid lacquer types to permit more rapid build-up in coating thickness and thus decrease the number of coats needed to obtain satisfactory protection; and 4) the sulfonamide resins which tend to increase flexibility of a coating, moisture resistance and increased stability toward light. The clear methyl-methacrylate lacquers produce a hard, abrasion resistant, transparent film on aluminum. However, since it is a thermoplastic, the film has a tendency to soften when heated to 180° F. Lacquers are desirable in production because they dry rapidly.

Synthetic Enamels; Air Dry and Bake

Enamels, because of the variety of synthetic resin additions, can be selected to obtain finishes that vary widely in both physical properties and resistance to corrosive environments. Enamel finishes are characterized by good gloss and resistance to mechanical abuse. They are widely used for both decorative and protective finishing. [*To page 72*]

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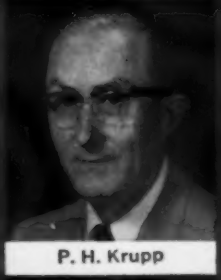

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One of the enamels often used for coating aluminum is an alkyd resin type, modified glycerol pthalate, plus a plasticizer in a hydrocarbon solvent. This type of enamel is quite durable, has excellent adhesion, good flexibility and does not chalk upon weathering. It will air dry, or it can be baked at about 180° F. The urea and melamine resin type enamels have also increased in usage, since they exhibit good resistance to abrasion and wear.

A plasticizer, usually a medium oil length alkyd, will broaden the usage of these amine type resins. These alkyd-amine type resin enamels are adapted to infrared baking schedules. The film produced exhibits hardness, durability and alkali resistance, combined with good color and gloss.

Melamine resin type enamels, in a suitable solvent such as butyl alcohol, are used to produce a quick drying surface coating which is resistant to water and sunlight exposure. These resins are thermosetting and the finish should be baked at about 350° F.

Bituminous Paints; Luminous Coatings

Bituminous paints are usually formulated with a material such as asphalt, plus driers and drying oils in a suitable solvent. They may be pigmented if desired. These paints normally knows as "japans", may be applied to aluminum-base alloys to protect the surfaces from highly corrosive conditions encountered when embedded in soil or concrete, or when immersed in salt water. Although some of these coatings will air dry satisfactorily, there are varieties that require baking at about 250° F. Bituminous paints are also manufactured in a water-emulsion type and are comparable to the solvent japans in performance characteristics.

Luminous paints must be applied over a white primer coat which is free from lead. The pigments generally employed in luminous paints are of the sulphide type, such as zinc sulphide and calcium sulphide. They generally react unfavorably with either lead, manganese or cobalt. Better results are obtained if a special lacquer vehicle is added to the basic formulation. This will improve both the drying characteristics and the stability of the mixture. The activity of luminous paints diminishes very little with interior usage. However, a service life of only one to two years can be expected when the product is exposed to outdoor service. If outdoor exposure is anticipated, a top coat of a clear vehicle should be applied over the luminous paint to extend its useful life.

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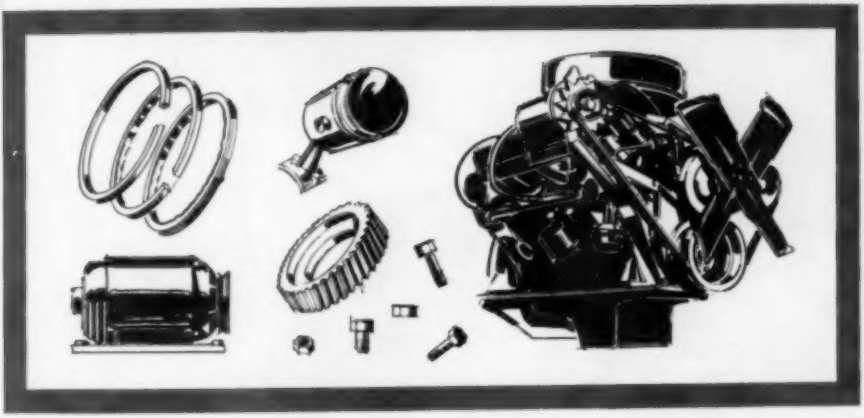

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Fig. 2 (Left)—Here the lacquer tank is tipped forward for refilling. The operator's hand is on the lacquering head through which handles are forced by grooved rollers.

Fig. 1 (Right)—Mop handles are moved from truck to hopper at infeed end of machine; they feed through the lacquering head and drop onto a conveyor.

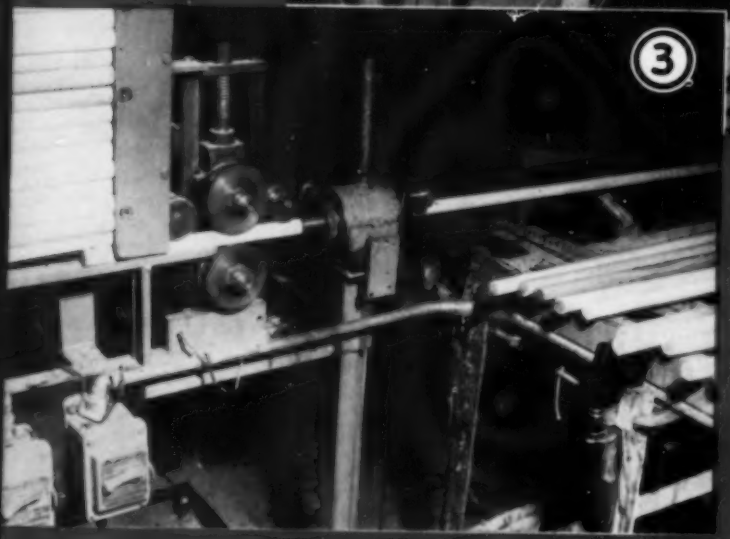

Fig. 3 (Left)—View of grooved rollers feeding handles from the hopper at left through the lacquerhead and squeegee.

Squeegee Lacquering of Wood Mop Handles

By Walter Rudolph

SWANSON BOAT OAR CO., Albion, Pa., had a special automatic lacquering machine built in order to win a Navy contract for making mop handles that require one coat of clear squeegee lacquer. Actually the machine can lacquer upwards of 1500 handles an hour, but at this rate of production more workers would be needed to process the handles off the machine and through subsequent operations.

As it is shown in these action photographs, the machine is operating at about 750 mop handles an hour. In Fig. 1 (opposite page) you see handles in a factory truck at right, before they are placed in the machine hopper from which they feed into and through the lacquering head.

Lacquer Holding Tank; Squeegee Head

A close-up view of the lacquer-holding tank is shown in Fig. 2. This tank has a capacity of about five gallons, and is tipped up in the position shown when lacquer is poured into the cut-away side at right. Operator has his hand on the head of the lacquering chamber, which has a short dowel in the exit side of the head.

On the left, in Fig. 2, can be seen a partial view of the 20-ft. continuous conveyor table on which mop handles travel during a flash drying period. Coated handles rest on the points of big tacks which protrude from narrow rubber belts as they move away from the machine.

A view of the machine from the operator's side, feeding handles from left to right, appears in Fig. 3. Controls for the feeding arrangement are shown at the lower left. A handle is shown almost through the lacquering head, through which it is pushed by

Fig. 4—Steam radiators under the low-level take-away conveyor help to speed the drying of lacquer coating during cold weather.

grooved rollers. The feed rollers are spring-mounted and powered by a reduction gear and fractional horsepower motor at the rear of the machine.

Ordinarily the mop handles are ¾-inch in diameter, but variances in this size can be accommodated by the insertion of different size sheet rubber squeegees at the exit side of the lacquering head. The squeegee action is obtained when the handles pass through a clean-cut hole in a thick sheet of rubber. The hole in the rubber squeegee, of course, is slightly smaller than the diameter of the wood handle.

Conveyor Line; Drying; Unloading Station

To speed up the drying of the lacquer coating on handles during cold weather, steam heated radiators are positioned under the low-level "take-away" conveyor line, as shown in Fig. 4. During the summer, the mop handles are flash dried by the time they complete the 20-ft. length of travel along the conveyor to the take-off station.

At the station where lacquered handles are removed from the low-level take-away conveyor, two workers are kept busy. One feeds handles into a machine to cut down the handle end, and then gives the handle to another worker who feeds it into a machine that threads the end. Finished handles are placed in factory truck, at right.

Variations in the speed at which mop handles can be lacquered and conveyed on this machine can be made through adjustments to variable speed pulleys and the reduction gears fitted with step cone pulleys. Swanson does two and three-coat work with this machine too, simply by running job lots through the machine a second or third time.

Fig. 5—At end of the low-level take-away conveyor, workmen remove handles from conveyor and stick one end of each handle into a machine that cuts a tenon and threads at the end.

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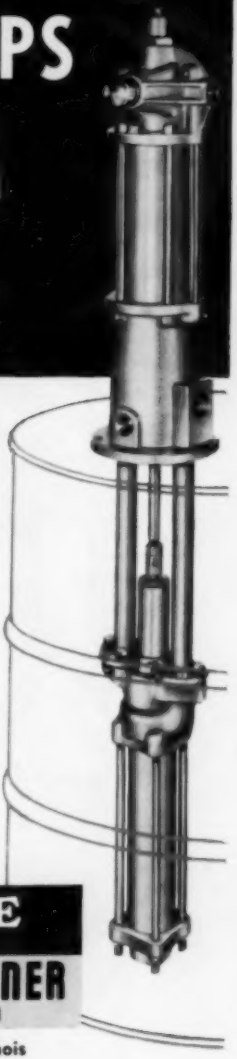

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High volume, maximum capacity—Models deliver from .4 to .65 gallons per cycle with the capacity to serve *2 miles* of pipeline!

Clean, ice-free performance—Submerged rod packings retain possible by-pass of materials within original container, prevent mess and waste! Large straight-line exhaust port, and aluminum body minimize icing!

Minimum maintenance—Separated design prevents paint from contaminating air motor. Get up to 12 months continuous use, without service!

Proved efficiency—Alemite "78" Paint Pumps are tested and proved by actual on-the-job use. They use less air to deliver more paint, through longer supply lines and more outlets than any other equipment manufactured!

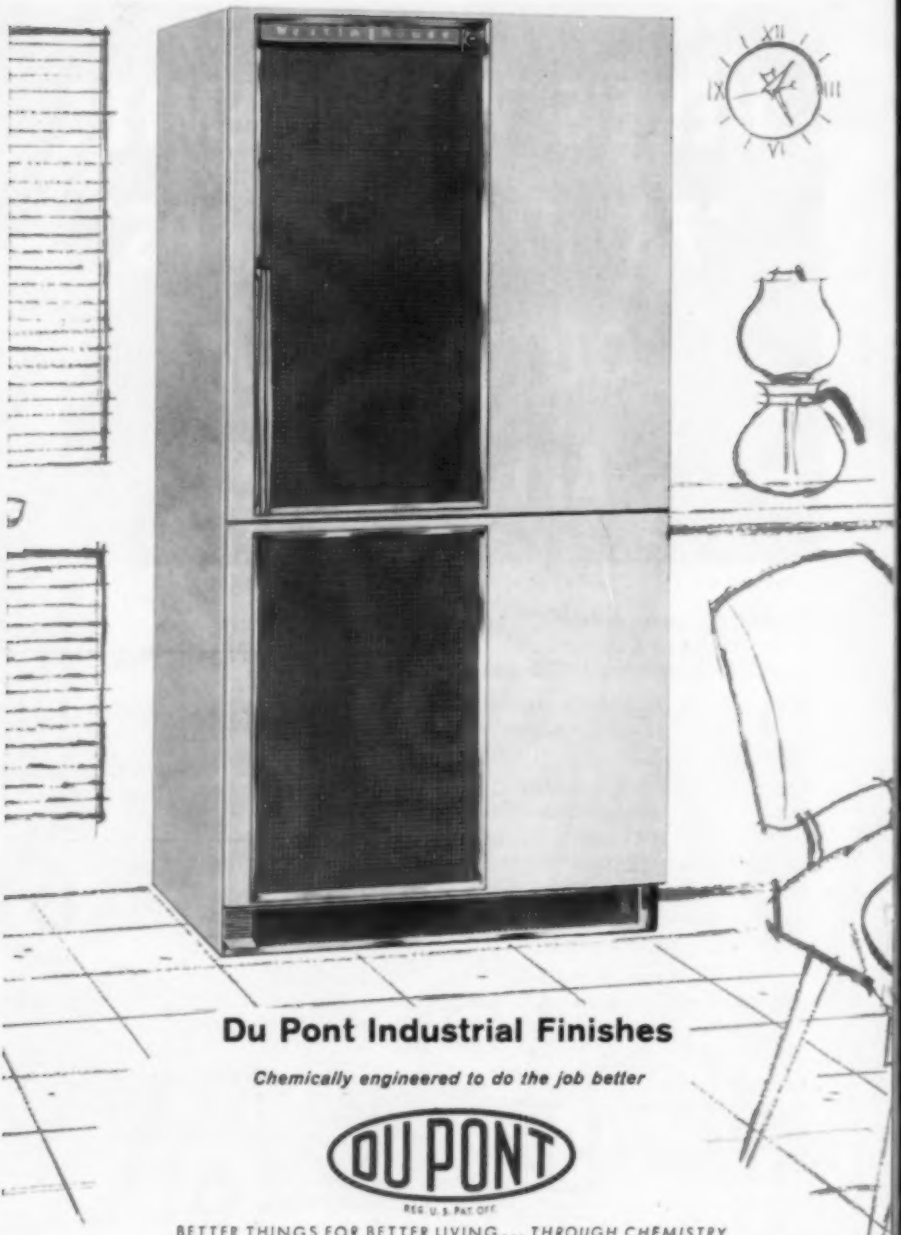
With so many ways to improve painting efficiency, it's little wonder the switch is to "78" Pumps!

Symbol of SW Excellence

ALEMITE
DIVISION
STEWART-WARNER
CORPORATION

1850 Diversey Parkway, Chicago 14, Illinois

For more data, circle 183 on colored card.



Du Pont Industrial Finishes

Chemically engineered to do the job better

DU PONT

REG. U. S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING ... *THROUGH CHEMISTRY*

For more data, circle

Westinghouse Custom Imperial line

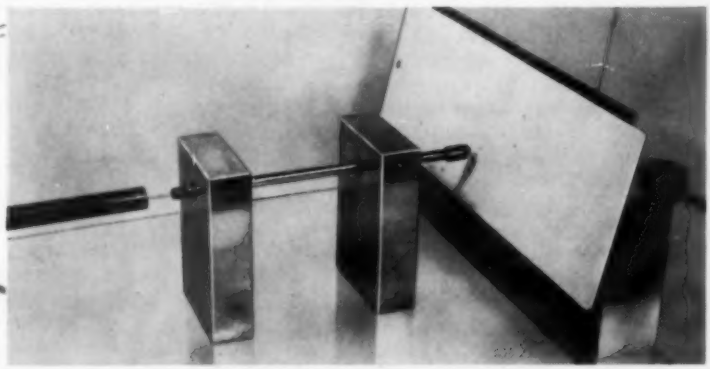
gets a custom-made Du Pont DULUX® Enamel Finish

A choice of cabinet colors offers extra sales appeal to the Westinghouse refrigerator line. The appliances' practical beauty—they're as durable as they are attractive—comes from a Du Pont Finish, developed especially for the job.

Product development is a regular Du Pont service. From long experience with products as diverse as farm machinery and filing cabinets come applications to many more. In fact, of the more than 12,000 Du Pont finish formulas serving industry today, a good share were custom-developed.

And whether you now use flow coating, roller coating, dip-tank finishing, hand-spray or automatic systems (including electrostatic), there is a Du Pont finish for you.

Improvement of the product *and* production is a Du Pont function. To draw on this experience yourself, simply write: E. I. du Pont de Nemours & Co. (Inc.), Finishes Division, Wilmington 98, Delaware.



Chip Resistance Tester subjects finish to blows of steel plunger, activated by spring action. Adjustable for force of blow and angle of impact, tester demonstrates how finish formulations stand up in use.

34 on colored card.

EDITORIALS

Are You Putting On Excess Finish Material?

★ Recently I checked film thicknesses of the finish on three appliances. These three appliances were essentially the same, but were manufactured by different companies. In all three cases the film thickness on the same appliance varied widely from area to area. On one appliance the thickness varied from 1.3 mils to 3.4 mills. This non-uniformity is typical of what I have seen on a number of products.

In many plants little effort is made to apply industrial finishes of uniform thickness. It is not that too little finish is applied. This condition would quickly show in poor hiding and poor gloss—in most cases. It is rather that too much finish is applied in some areas. This does not necessarily affect the surface appearance, but isn't it a useless waste of finishing material? It is admitted that if a unit is hand sprayed, the uniformity of film thickness will depend largely upon the skill of the spray operator. Also, some objects are of such shape that to apply anything resembling a uniform coat is practically impossible.

The fact is that the production personnel in many plants do not have an instrument for measuring the dry film thickness of a finish. The finish is merely presumed to be uniform and is rarely if ever measured. Most of the companies that manufacture industrial finishes have a thickness meter for measuring film thickness on steel. They would be glad to loan it to a customer or to check film thicknesses for him. Once you know the typical film thicknesses at various areas of a coated object you can decide if they are satisfactory. If not, you can try to make the coating more uniform by changing the spray pattern or by some other means.

I am convinced that many companies would save finishing materials (and consequently money) by ending the useless and wasteful piling on of coating materials in certain areas. The quality of the coating would not be harmed. It might even be improved.—*George Grant.*

★ *Guest editorials . . . . Many readers can write an excellent editorial—two or three paragraphs that present a timely suggestion or valuable idea which will stimulate thought on a live subject. The Editor welcomes guest editorials and pays for those used.*

Lighting to See and to Match Colors

★ Manufacturers of finishing materials have established dependable methods for controlling the colors of all colored materials they ship to their customers. The average color control lab has the most modern equipment available for scientifically controlling colors of finishing materials. But no matter how well the

● PERFEX SATIN FINISHES FOR CASKETS...

No Rubbing Needed!...

You can secure that hand rubbed appearance and waxed feel – without the costly rubbing operation – on **CASKETS** and many other products, especially household furniture, with Perfex Satin Finishes.

Perfex was the original "flat" to be made by a new and different process (without the use of stearates or flattening agents) and it is still the "flat" which comes nearest to producing an actual rubbed appearance.

PERFECTION

PAINT AND COLOR COMPANY

INDIANAPOLIS 2, INDIANA

If you manufacture caskets or furniture and are interested in securing an excellent rubbed finish effect, without a costly rubbing operation, we invite your inquiry.

For more data, circle 185 on colored card.

color has been controlled in the plant where the finishing materials were made, if there is not proper lighting provided where those materials are applied, there will be no assurance of color uniformity in the finished products.

In some finishing departments there is no proper lighting for the application of finishing materials. This can permit some variation in color; and it can be responsible for the operator not seeing some of the runs and sags in color and clear coats, and a number of other defects in finishes.

In certain finishing rooms and paint shops you will find them still using old incandescent lights which have been in use for many years. In other places they are using fluorescent lights, but of the wrong color. The so called "white" or "daylight" fluorescent lights are too white; this causes a furniture finish, for example, to look too cold; it prevents any red or brown from showing in the finish. Other fluorescent lights of the so-called "warm sunshine" color cause the finish to look too brown or perhaps make it seem to have an unnatural reddish tint.

The best color fluorescent lights to use for checking and controlling colors in finishing—especially in fine furniture finishing—are the so-called "color corrected" lights. These lights are in balanced colors; they are between the white and the brown or yellow color fluorescent light tubes.

To properly light a finishing department requires the services of an experienced lighting engineer who can check and determine both the candle power needed to provide enough light to properly perform all finishing operations, and the color of lights required to control colors in whatever kind of finishing is being done.—*H. W. Chester.*

How Long Can Paint Be Stored?

★ Many of us agree in principle to the rotation of our paint inventory, but fail to practice it 100%. In so doing we are "asking for trouble" because eventually we may have overbodied, seedy or even gelled finishing materials. It is easy to lose sight of the fact that we are working with a material which, by its very nature, has a certain degree of reactivity.

Both air-drying and baking coatings dry or cure by a process of oxidation and polymerization. This reaction is greatly accelerated by the application of a thin film which is exposed to the air. Heat speeds up this process even more. Nonetheless, an exceedingly slow build-up of molecular weight does occur in the package. This increase over a period of weeks or several months, is so slight that it is of no consequence. However, when the package coating material is left for months on end it can become significant.

This condition manifests itself first in a gradual rise in viscosity. A movement into the 50% to 100% increase range, for example, necessitates considerable more solvent for reduction. Obviously this in itself is wasteful. Furthermore, it means lower solids content and consequently the application of a thinner, poorer hiding film. If it is a sprayed application, this can only be overcome by time-consuming extra passes with the gun. However, paint at this point is still usable.

If the material, through neglect, is allowed to age even further, the resin constituents finally begin to form a semi-solid mass, which we recognize as a gel. At this stage our finish is irretrievably lost.

No specific rules with respect to time can be laid down, since each ma-

MAR-PROOF LACQUER

SCHAEFER'S Mar-Proof Lacquer is a performance-proven finish that cannot be easily marred or scratched.

It's tough—tougher than the ordinary lacquers; meets the most critical requirements of current production.

Made in either clear gloss rubbing or satin finish, it produces a splendid transparent coating of full depth on maple, walnut, gum, mahogany and other cabinet woods.

Economical; gives plenty of coverage and dries quickly. Our Mar-Proof Lacquer Sealer is recommended with it for a first-coater.

Working samples furnished without obligation. Write for them!

THE SCHAEFER VARNISH COMPANY, INC.
Louisville, Kentucky

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SCRATCH-PROOF

MAR-PROOF

STANDS LOTS OF ABUSE

terial has its own inherent stability. Naturally, with a high initial viscosity, we are more susceptible to further inordinate increase. Low viscosity paints (below 30 seconds in a Ford No. 4 cup) can be stored for much longer periods of time, as can lacquers. In general, however, we should figure on a maximum of six months storage time.

Sometimes material is unavoidably left over after a run. If we intend to use the paint within six months, it should be partially reduced and carefully stored in a filled, well-sealed container inside a building. Storing it outside in the sun is definitely not advisable. If more than six months time before use is anticipated, the possibility of using it sooner by reshading it or blending it with a different type of application should be investigated. Frequently the paint supplier is in a position to help, either by suggestion or by taking the material back for partial credit.

It is evident that the proper scheduling of paint purchases from the standpoint of both time and volume is a necessity. When this is coupled with a systematic inventory control, we have taken one more step toward keeping our paint lines running smoothly and efficiently.—*K.S.*

Better Quality Demands A Higher Price

When you stop to think of it, you realize that there is quality competition as well as price competition, but you don't hear so much about it. Many people generally consider competition in terms of price alone. On the surface, price competition is the most obvious variety; some customers find this type most convenient for making quick comparisons. The salesman finds that if he can show a price advantage, he apparently has an easier selling job. When it comes to selling superior quality at a higher price, however, the customer must be shown and convinced—and often that is a difficult thing to do.

One factor that cannot be overlooked is that the cost of quality represents added cost in design, materials or production—and any one or a combination of all three. Quality of the product cannot always be detected by outward appearances. An example of this would be two drums of paint. Both are the same color and appear to be the same. One drum costs the customer $220 while the second drum costs $193, representing an apparent saving of $27 per drum. To even a small user of finishing material, this price difference would be most attractive. But the quality of the two paints have not been compared, nor has the paint mileage been considered. From a square foot coverage basis, at equal dry film thickness, the higher priced drum of paint may be the better buy—but the customer must be shown; he must be convinced that while quality merchandise may appear to be more expensive, it is really more economical and profitable in the long run.

Of course, there are several intangible features (perhaps unseen at the moment) to be considered in connection with the film of paint produced by any paint under consideration. For example, adhesion, durability, flexibility, hardness, smooth flow-out, color stability, resistance to easy marring, speed of drying, etc.

Quality has many and varied facets. For instance, phosphatized steel (to increase adhesion of the paint and inhibit creeping rust if the painted surface is damaged) versus just plain painted steel, probably solvent washed by hand; or putty glazed and painted castings versus just primed coated and painted ones; wood products fin-

MAC'S UNIFLO STAINS

MAC'S UNIFLO STAINS are finely dispersed pigment stains which can be applied by spray or brush to close grained woods such as Poplar, Gum, Maple and Birch.

ADVANTAGES

1. They possess excellent flow out properties and do not require wiping.
2. Give appearance of a wiping stain and impart very good color uniformity to the wood.
3. Air dry in one hour.
4. Can spray chairs and other pieces with hard to reach corners without showing white lines.

Order a 5-gal. can at drum price and convince yourself.

"Eighty-five Years of Service"

The Lawrence-McFadden Co.

Headquarters for Fine Finishes Since 1875

7430 STATE ROAD **PHILADELPHIA 36, PA.**

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ECON-O-VEYOR

HOW MANY OF THESE COST-CUTTING MATERIALS HANDLING IDEAS CAN YOU USE?

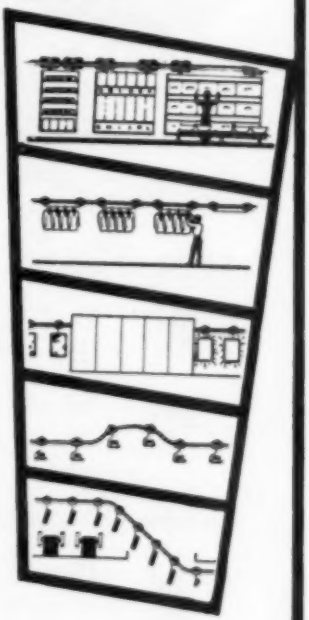
In installation after installation, the exclusive engineering features of the ECON-O-VEYOR OVERHEAD CONVEYOR means immediate savings in handling costs. Now ECON-O-VEYOR has put many of these applications in a new, illustrated manual—ideas you can probably use in many of your own operations to help slash handling costs. You'll see how

A FOOD PACKER found the Econ-O-Veyor ideal to carry (and store) empty container cartons out of the way along the ceiling, transferring them to the carton packing point as needed.

A FOUNDRY uses an Econ-O-Veyor to carry castings from one operation to another on several floor levels.

A WHOLESALER has his Econ-O-Veyor carry racks and bins of merchandise past order fillers, who simply select items from inventory as racks come by.

Ideas such as these, in addition to illustrated explanations showing the best conveyor system for your needs, are all in the valuable new ECON-O-VEYOR POWER OVERHEAD MANUAL.



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ished in a lacquer that will eventually yellow with age versus a clear water white lacquer that remains really clear.

Price is certainly important, but don't overlook quality. It may help to make the difference between your company's continued success and its eventual failure.

Finish Salesmen Who Are Always Welcome

★ There has been a decided change in the successful salesmen's approach to selling his product. In the old days the average salesman called on a customer and if it was a regular account he usually "beat the breeze" with the customer for a short time, and then took an order for material if this customer needed it. If the salesman did his own service work, he only came when he was called because of trouble and perhaps when the customer asked for his help to work out new colors for the Furniture Show. If a service man was available the salesman usually sent him (the service man) instead of going himself, when his customer needed service.

The successful salesman today uses a different approach to selling. In the first place, most salesmen who sell finishing materials are experienced service men themselves. Their first approach to a new account—or to an established account—is usually to submit the very latest in color styling on some perfectly finished panels. If the customer selects a color then the salesman has made a valuable sale, because he usually is able to induce his customer to use all of the materials needed to produce the new color.

The alert salesman also makes his services available for the application of new materials to samples. He keeps in constant contact with his customer in order that his services are always available, whether it be for trouble shooting, demonstrating new materials or working in color styling. Service plays an important part in selling finishing materials today.

The man who is well informed on materials and new finishes, who is skillful at matching colors, and who knows finishing procedure well enough to be a good trouble shooter—he is never given the brush off, that is not by anyone who knows him; more likely he will have difficulty getting away from an establishment that does any fine finishing or product painting.

The wise salesman also has a smaller territory to cover; this enables him to call on his customers at least once each week to offer his services. Where the average salesman formerly spent a minimum of time in servicing an account, the most successful finishing material salesmen today generally spend a lot of time rendering service to their customers. —*H. W. C.*

Pountney Jr. is Made Research Director for DeVilbiss

Clifford Pountney, Jr., of Cleveland, has been appointed research director for The DeVilbiss Co., Toledo, Ohio.

Mr. Pountney was director of research for National U. S. Radiator Company, Cleveland, for three years before taking his new post. He had previously held executive research positions for five years with American Gas Association laboratories in Cleveland. He is a member of the Association of H.R. & A.C. Engineers and of the Cleveland Association of Research Directors.

LETTERS from READERS

Fast Color Changes

In the April issue of *Industrial Finishing* the article, "Fast Color Changes When Painting Tubular Chairs," pages 10-16, is very interesting and we are wondering whether we could obtain a supply of tear sheets? —*H.P.Co.*

Yes, we are sending you tear sheets. —*Editor.*

Would you please tell us the address of the Douglas Fisher Corp., manufacturer of tubular chairs described in the April issue?—*R.F., Inc.*

The address is 2401 Grant Ave., Bellwood, (near Chicago), Ill.—*Ed.*

Like Article in April on Conversion Coating

We are very interested in the article, "Aluminum Disposer Parts Get Conversion Coating," beginning on pages 50-51 of April 1960 issue.

The article does not identify the cleaning, deoxidizing and conversion coating compounds used in the Waste King plant, but they are Oakite materials, and the man in the business suit in the photograph on page 50 is Roy Webb, our technical service representative who services the Waste King plant.

We'd like to reprint the article in our external publication Oakite News Service. We would give you the usual reprint courtesy line, of course. May we have your permission to do so? And may we borrow the photographs? We'll return them when we've finished with them.

In reprinting the article, we'd like to add a paragraph footnote which would identify the compounds used. I hope that will be all right with you. —*Oakite Products, Inc.*

It's okay with us.—*Editor.*

Transparent Test Cabinet

Please have sent to my attention the literature and prices on the "Transparent Test Cabinet," called G-S, made of H-T Plexiglas, as illustrated on page 4 of the "Random Comment" section of April issue. —*B.V.Co.*

This is a product of G.S. Equipment Co., 15583 Brookpark Road, Cleveland 35, Ohio.—*Editor.*

Wood Grain Polystyrene

Concerning the Feb. issue, page 78, on the above subject, we would also be interested in such a wood graining machine. Would you kindly put us in contact with the company or companies which have a machine in this general area (Newark, N. J.)?

Also, in the April issue, page 86, we would be interested in obtaining

If

you use ONE DRUM of ONE COLOR per DAY

A NEW ARO BULK PAINT HANDLING SYSTEM

will pay for itself in 12 months

Now—even "drum-a-day" users of paint or coating materials can pay for switching to ARO Bulk Handling Systems in one year, OUT OF SAVINGS ALONE. Send for complete details on how *you* can reduce your paint handling costs, reduce your finishing materials costs, provide better finish and quality control, while reducing your fire and explosion hazard.

"ARO performs magnificently for bulk paint handling," says this user.

Write, wire or phone today for complete information.

The Aro Equipment Corporation
Bryan, Ohio

Aro of California, 3141 S. Grand Ave., Los Angeles 7, Calif.
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ARO ®

BULK PAINT HANDLING SYSTEMS

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the information on an areosol hand style spray bomb for Urethane Foam. Kindly cantact us if you do receive the information.—*R.M.Co.*

We are sending you names and addresses of manufacturers of graining machines, but we do not have information on your second question.—*Ed.*

"I made twenty dollars profit, selling chances on my ninety-dollar pay check."

Coating With Dry Paint

In the May 1959 issue of your magazine you had an illustrated article entitled, "Coating With Dry Paint." I am very much interested in this process. The article mentioned the Shell Chemical Co. as having this process. If the additional information is still available, I would appreciate your sending it to me.—*R.N.R.*

If you had read the last line in that article you would have learned that, "The process . . . . is licensed in the U.S. by Polymer Process Industries, Reading, Penna." The Shell Chemical Co.'s New York office is at 380 Madison Ave., New York 17, N. Y.—*Editor.*

We Have Lacquer Sticks

In the Letters from Readers, April issue, page 76, we notice that there are inquiries for lacquer sticks, and possibly shellac sticks too.

First, would you please tell us the name of the firm that made this inquiry, so we may write them?

Second, if you keep a listing, we would be happy to be listed as a supplier of shellac and lacquer sticks; also dowel pins and adhesives.—*The Arteil Co., 78 Clinton Ave., Westwood, New Jersey.*

Hose With Static Wire

In reading over April issue, pages 102-106, I came across your article entitled, "Static Electricity Worried Spray Man."

Reading through the two answers to his problem and his reply, it appeared that we have a standardized product which would help him overcome this static problem.

If you will refer to page 2 of the I-5001-B hose catalog we are sending you, you will see that we manufacture a corrugated cover air hose which is complete with static wire. As stated, this static wire is of continuous length, of fine braid, tinned copper wire and is available in all lengths that you would consider to be a standard in the spray painting field.

Also available are little metal clips that are inserted into this braid and bent backwards over the exterior surface of the hose. This then makes a contact with the metal hose connection which, of course, would be used at both ends. This would then ground the spray gun to the air transformer or regulator which, in turn, could be grounded to the spray booth, conveyor, product support or what have you. In this way, all portions of the system could be at zero potential. The

The finish on farm implement wheels takes about as much abuse as any application we can think of. That's why the biggest wheel supplier to the implement industry finishes with gleaming Armstrong *One-Coat-Spray* Aluminum Paint, made with ALCOA® Pigments by Armstrong Paint & Varnish Works, Inc., Chicago, Ill.

The French & Hecht division of Kelsey-Hayes Co. selected Armstrong Aluminum Paint for durability and appearance . . . and remarkable resistance to weather and abrasion. Production costs are lower, too. F&H hot-rolled steel wheels and rims are simply degreased and sprayed—one coat covers. Result: bright sales appeal and years of protection.

Alcoa does not make paint, but paint manufacturers, working with ALCOA Aluminum Pigments, have developed a wide range of metallic finishes that give extra protection, build big sales for a variety of products. These finishes cost no more than ordinary coatings and save money on surface preparation as well. Get all the facts from your paint manufacturer, or write to ALUMINUM COMPANY OF AMERICA, 1746-F Alcoa Building, Pittsburgh 19, Pennsylvania.

Look for this label . . . it's your guide to the best in aluminum value

ALCOA ALUMINUM

For exciting drama watch "Alcoa Presents" every Tuesday, ABC-TV, and "Alcoa Theatre" alternate Mondays, NBC-TV

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hose is interchangeable with any type now in use and offers a less complicated means of attaching a ground wire to the spray gun.

As we do not have the gentleman's name and address, it may be possible for you to pass along this information for us. If desired, an additional copy or copies could be forwarded to you if you wish to have this information on hand for any further inquiries.

We hope that this bit of information will be of help to your reader and if there is anything he wishes, we suggest he get in touch with the DeVilbiss Co. or any of its many distributors; then he would have a ready-made answer to a large part of his problem.—*DeVilbiss (Canada) Ltd.*

Thank you for your informative letter. We are sending you the name and address of "R.N." whose question was published in April issue.—*Editor.*

To Paint Sunken Letters

Would you kindly inform us what company is referred to in your article, "Painting Sunken or Debossed Lettering," on pages 114 and 115 of April 1960 issue?—*W. C. Co.*

Yes, in a letter we are submitting the names and addresses of three possible suppliers.—*Editor.*

Gold and Color Stripes

In April issue, pages 117 and 118, we read an article entitled, "To Put on Gold or Color Stripes." Four methods of applying gold and color stripes on wood or metal products were described, the first method being that of applying 25-karat gold leaf in roll form. Would you please send us a list of sources who market this gold leaf in roll form?—*I.M.& F.*

One source we are sure of is Peerless Roll Leaf Co., Inc., 4511 New York Ave., Union City, N. J.—*Editor.*

"He's marking danger areas in the shop with yellow-orange fluorescent paint."

Bleaching Furniture

During the past three years there has been a great deal of bleaching done in the furniture industry, particularly on the better quality furniture. However, the high cost of installing facilities for bleaching has limited the use of bleaching to some extent.

Our company has erected one of the largest and most modern conveyorized bleaching plants in the country. We are therefore doing quite a lot of bleaching on our merchandise. We have done a great deal of research

and testing on bleaches. We have found that the conventional bleaches which have been used for years give us the best results.—*A Furn. Co. in North Carolina.*

Static Electricity

We have a customer who is spraying on plastic bottle caps and picking up a good deal of static electricity, thus attracting a lot of dust and lint. Can you recommend anything to eliminate the static electricity?—*L.W.Co.*

Yes, we have published several articles on this subject in recent issues. Have you seen the advertising of The Simco Co., 920 Walnut St., Lansdale, Penna.? One appears in this issue, page 114.—*Editor.*

Remove Old Finish by Sandblasting

Please give us the name and address of the company that supplies equipment and information on a sandblast method of removing old finishes.—*J.L.F., Inc.*

Try Pruden Tool Co., Inc., 310 W. 68th St., New York 23, N. Y.—*Ed.*

Painting Galvanized Steel

On pages 96 and 101, of the April issue I noticed two inquiries regarding problems of painting galvanized steel. With respect to these and for your purposes, I am sending you five copies of a 16-page booklet entitled, "Painting Galvanized Steel." If we can be of any further help regarding this matter, please feel free to call upon us.—*American Zinc Institute, 292 Madison Ave., New York 17, N. Y.*

Shoe Heel Lacquers

Please send us the name of the H. Heel Co., (April issue, page 78), who is looking for a silver and gold finish for Butyrate and Plexiglas shoe heels. We manufacture a complete line of finishes for plastics, and specialize in shoe heel lacquers.

Will you please also send us the name of the A.L.Co. (same issue, same page), who is looking for a protective hand cream? We make an excellent one. Thanks very much for your help. —*Waterlac Finish Co., Inc.*

Air-Dry Wrinkle Finish

Please forward the names and addresses of companies manufacturing air-dry wrinkle finishes, as referred to in your Letters from Readers, in the April issue, page 80.—*B. Paint.*

We would like information on an air-dry wrinkle finish that does not need baking to form the wrinkles.—*W. Casket Co.*

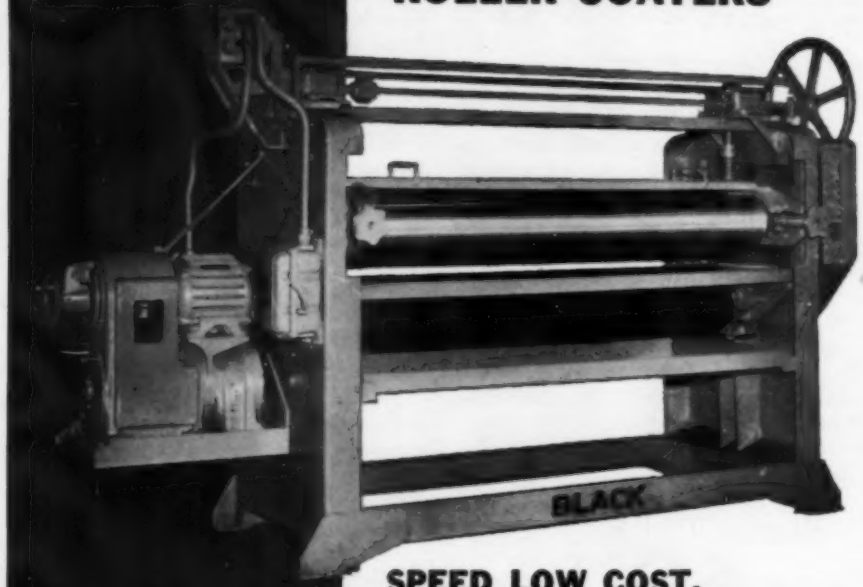
In a letter we are naming four sources of supply for air-dry wrinkle finishes. Please do not expect too much of these air-dry wrinkle finishes. They may serve your purpose, but naturally they are not as hard and durable as a baked wrinkle finish. —*Editor.*

Burning-in Tool

Thank you for your card referring a customer inquiry to us on "Pistol-Grip Burning-in Tool". We have contacted this customer and advised them we are manufacturers of Thornton's Heavy Duty Electric Burn-in Knife and can supply their requirements.—*L. M. Thornton Mfg. Co., Inc.*

BLACK BROTHERS

HEAVY-DUTY ROLLER COATERS



FEATURES

- 21 Standard Sizes From 8" to 122" Wide Capacities
- 0-4½" Thickness Adjustment
- Single or Double Coaters
- Patented Safety Control
- Drip-Proof Reservoirs
- Precision Ground Rolls
- Ball Bearing Throughout
- Micrometic Adjustments
- Single or Variable Speed Drives

Plus many extra-value optional features

SPEED LOW COST, HIGH QUALITY COATING

Whether your finishing needs are intermittent or geared to 24-hour-a-day automation, Black Brothers Roller Coaters can boost your production, reduce down-time, cut coating costs. These are heavy-duty machines, built rugged and rigid to *maintain* high quality production and trouble-free performance. Heavy distortion-free rolls apply *uniform* coatings — assure longer coating roll life. Chrome coated oversize doctor rolls give finer doctoring action.

Versatile, economical — Black's Roller Coaters apply lacquers, paints, sealers, varnishes, waxes, etc. to flat work such as wood, metal, plywood, composition board, hardwood, plastic, cardboard, cement board.

Write today for literature describing the oldest — most complete line of roller coating equipment, available with plus-value optional features to meet *your* finishing needs.

THE BLACK BROTHERS CO., INC.

MENDOTA, ILLINOIS *SINCE 1882*

For more data, circle 190 on colored card.

Look Out for Corrosion; It's Slow but Sure

CORROSION takes no holiday. It works while the plant operates, over night, over weekends and through vacation shutdown. It is capable of affecting any metal used in the plant, such as pipes, fittings, tanks, etc.

Time passes quickly, and as long as the equipment is functioning properly, little if any thought is given as to why it shouldn't continue to do so indefinitely. Then suddenly a fitting goes out, or a leak develops in a tank due to corrosion. In any case, all operation stops and remains down until replacements can be made. Perhaps the wrong kind of metal was used to begin with, or the same thing could apply to the coating material—for instance in a tank. Perhaps if a lining coating was used, it may have been scratched or damaged in some way that would eventually allow the corrosive solution to contact the metal.

Where highly corrosive solutions are used, it is important to choose the correct metal or the correct coating for metal surfaces that come in contact with these solutions.

Even moisture in the air can cause rusting of unprotected iron or steel. For metal that comes in contact with moisture vapor or high humidity conditions, the surfaces should be coated with zinc rich paints or other rust inhibiting coatings. Where any coatings or tank linings are used, periodic checking by planned maintenance may prevent expensive shut-downs and costly replacements.—*C. B. P.*

Talk that hits the target with one person may put another to sleep. Tailor what you say to your audience —and always give your listener credit for being a bit smarter than you think he is.

Moving and Storing Drums of Material

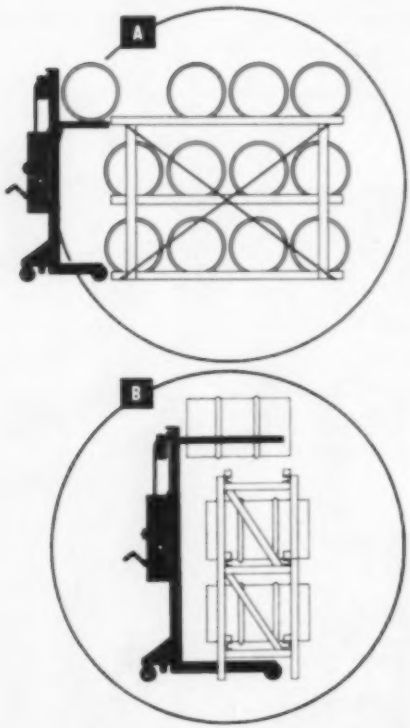
IN INDUSTRIAL finishing plants the handling and moving of drums of material is common in the receiving, storage and mixing areas. Many types of material handling equipment are available today. Some are specifically designed for use in areas where there is an explosion hazard because of volatile fumes.

One of the accompanying illustrations shows the use of a portable elevator in the receiving department for storage of drums in a multiple-deck steel rack. Combining the portable elevator with a storage rack is frequently done in the larger plants. Such racks are designed and built for

Loading a steel rack from the end. In some cases the horizontal rails have a slight pitch so drums will roll to the unloading end by gravity. An end stop prevents them from rolling off, of course.

either selective side loading or for end loading. The rack shown here is an end loading type. End loading racks may be loaded with either a fork or platform type lift, but the selective type requires a fork lift to move the drum in and out of the rack.

In other plants powered fork trucks may be equipped with various types of clamps which permit lifting the drum from the floor or rack, transporting it to the mixing room or spray painting area, and then rotating the drum in order to dump or pour its contents.—*William Busse, Revolvator Co.*



Racks may be built for either end loading (A) in which the drums are rolled in from the end and removed in the same way, or side loading (B) in which drums are placed separately from the side of the rack and may be removed individually and selectively in the same way.

Storing and Handling Solvents Safely

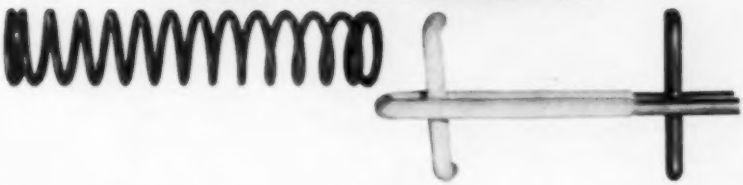
MOST insurance inspectors are very emphatic about insisting upon the grounding of solvent drums stored in the mixing room. Unfortunately it usually takes a fire before your plant operating personnel realize how important grounding cables are.

Every solvent drum should be grounded to the storage rack. The rack, in turn, should be grounded. When solvent is withdrawn from these drums a ground clamp should be attached to the drum and to the bucket into which the solvent is being poured. Wooden handles on paint type pails should be removed because these handles can serve as an insulator, particularly if the pail is hung on the drum spigot. Self-closing spigots should be used, and flashproof vent plugs should be used to let air into the drum.—*F. W. Porter.*

Schort Joins A-M at High Point

Donald R. Schort brings his many years of experience as an engineer and consultant on wood and metal finishes to the High Point Division of American-Marietta Co.

Mr. Schort is widely known in furniture manufacturing circles, especially in the southern area. He will represent A-M as Technical Sales Representative and will concentrate his attention in the western North Carolina area.



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QUESTIONS and ANSWERS

Filling Chip Board

Referring to April issue, page 102, where B. Mfg. Co. asks about filling the edges of doors made of chipboard we have done a great deal of development work for the particle board industry. Among the items we have developed are Gray Particle Board Backing Sealer and Natural Particle Board Putty.

The Gray Particle Board Backing Sealer was developed especially for coating the back surface of particle board when used for dinette table tops. Its purpose primarily is to maintain the dimensional stability of the top after the face side has been laminated with a Micarta top in a cold press.

Your question, however, deals with a particle board filler. Our Particle Board Filler was designed to be used in conjunction with a machine manufactured by Schmutz Mfg. Co., to apply filler to the face sides of particle board. To the best of our knowledge, there is no mechanical means availaple for edge filling.—*Reliance Varnish Co.*

Force Drying Finishes On Wood Products

It has been suggested that we contact you regarding finishes and the application of paints to wood surfaces. We have requested, from the Forest Service, information in regard to experiments on finishes that are force dried and those that are natural dried. We would like information as to which is the better finish or which is more satisfactory, whether a finish is force dried or natural dried. We would like this information regarding finishes, especially on laboratory furniture, library furniture and industrial furniture.—*H. & B.*

The best comparison we could make would be with that of kiln drying wood. Air drying of wood over extremely long periods of time (years) is outmoded. On the other hand improper kiln drying of wood would prove disastrous. The same applies to the force drying of finishes on laboratory furniture or any other kind of furniture.

The quality of the finish on any wood product can not be determined by whether it is air dried or force dried. Of course, it would be difficult to ruin the furniture or the finish if it was air dried over a long period of time after each coat had been applied. But this is not necessary.

The facilities used for force drying the finish on wood can be equipped with humidifiers and set to maintain a relative humidity suitable for the temperature used for drying the finish, and excellent results will be obtained. In fact practically all of the larger furniture manufacturers are force drying the finishes on wood products including furniture.

Two types of ovens are used for force drying the finish on wood, namely convection ovens and infrared electric ovens. The important thing to remember is that force drying of

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CHATTANOOGA, TENNESSEE

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wood finishes has gone far beyond the experimental stage. It is being done today in thousands of plants in this country.

In a letter we are naming several firms who have done research on the force drying of wood finishes and we suggest that you write them, giving full information on the specie of wood used, your present finishing system, volume of production, and the approximate space available for the installation of force-drying facilities.—*P. C. Bardin, Associate Editor.*

Fishing Lure Finish

We are manufacturers of fishing lures and we have a problem. We use a birch wood for one of our plugs. Sometimes — not always — the paint cracks after some use. We build up our finish with many coats of a lacquer-base paint. Can you recommend a remedy, or source where we may obtain information. Perhaps we should use a filler or some base coat. —*B. B. Co.*

With so little information it is difficult to determine why the paint peels off some of your plugs. One large manufacturer of fish lures uses the following procedure:

The plugs are immersed in a penetrating oil sealer overnight. When removed from the oil, they are dumped out on wire mesh racks to air dry for 48 hours. Then they are dipped in pearl essence lacquer and allowed to air dry for about eight hours. Then an air brush is used to apply scales, colors, etc.

If you do not apply a pearl essence finish, and wish to finish in the natural wood, you could soak the plugs in oil, then dip in a good grade of spar varnish. The number of top coats you apply is not as important as the preparatory coats under the top coat. Incidentally, should you wish to apply a pearl essence finish, only genuine pearl essence should be used. The synthetic pearl essence will turn yellow after repeated use in water.—*M. D. L.*

Silicone Polishes Give Refinisher Trouble

I know you have covered this subject at some time, but I don't know what copy to look for. I am having trouble with the effect of silicone polishes in refinishing. Can you give me the name of a supplier who has the solution to this? Is it possible to find out what polishes contain silicone? And is it possible to check a piece before refinishing to see if it has been subjected to silicone polish?

I have heard that some silicone "killers" tend to eventually weaken a finish. Is this true?—*W. S.*

The only way to determine whether or not a polish contains silicone is to have it analyzed by a chemical laboratory.

In answer to your second question, you can generally tell whether a piece of furniture has been treated with a silicone polish, by rubbing a rag or your finger across the surface. If it slides very easily, without any "drag" or resistance, the surface has been polished with a silicone polish. If you are not sure of the "feel," you may experiment with a piece of furniture by polishing half of the top with a silicone polish and the other half with a non-silicone polish and then use a rag or your finger on both, and you will find that the half containing the silicone offers no resistance.

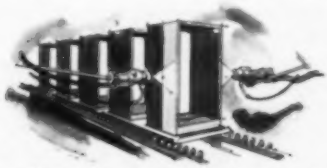
The answer to your last question, we do not believe that "fish-eye kill-

The man from "Minnesota" was here...

Result: When Minnesota-painted cabinets get banged around, it's not the end of the finish!

Metal storage cabinets and shelves on office and storeroom duty take a terrible beating. All the scratching, banging, and bumping scuffs them up so fast it makes a good product look bad.

So, Inca Metal Products Corporation of Carrollton, Texas—searching for a torture-resistant finish—called in the nearby man from Minnesota. He took Inca's problem to Minnesota's experienced staff of industrial paint chemists. After thoroughly analyzing and experimenting with



the problem, they recommended a formulation so durable and so distinctively shaded, Inca is now using it on all their top grade steel cabinets.

Inca first bonderizes its heavy gauge steel cabinets, then electrostatically applies and bakes on the tough Minnesota Paints enamel.

Minnesota Paint's laboratory facilities and paint chemists are at your service, too. Let them analyze a sample of your present finish. They'll find out if it is the most effective and economical paint formulation available today for your particular application. Call the man from Minnesota near you. He'll handle the whole thing. No obligation.

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er" additives have any harmful effect on the finish. In a letter we are giving you the names of a few reliable firms that supply "fish-eye killer" additives for finishing materials.—*P. C. Bardin.*

I suggest that W. S. read my article on this subject in January 1960 issue, starting on page 93 and continuing through to page 96. I believe this will clear up most of his questions.

Silicone polishes are here to stay and it is probable that refinishers will run into this problem with increasing frequency. My impression is that the labels on the polishes reveal the presence of silicone.

One sure way to determine if the surface has traces of silicone on it, in troublesome quantities, is to spray a section with the finish to be used. The "fish eyes" will develop immediately. If they do not develop, go ahead with the refinishing job. If they do show up, wash off the test surface and clean the whole surface in accordance with the instructions given in my article in January issue.

According to the data received from inquiries, the silicone oil (probably methyl silicone) is used in very small proportions, about 0.02% and should not adversely affect the film.

Finally, my article in January issue gives the names of wash-off materials. —*C. R. Brown.*

Edge Graining Drawers

We are interested in a graining tool for graining the top edges of drawers. Thus far we have not been able to locate anything that would serve our purpose. We must have a piece of equipment that only weighs two or three pounds, since the top edges of the drawers are to be grained on a moving conveyor.—*P. F. F.*

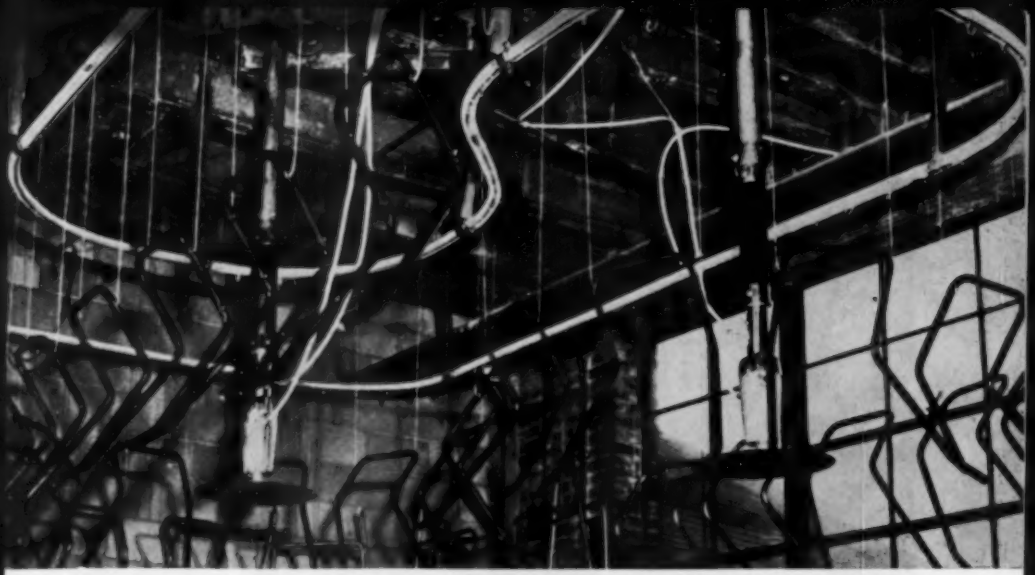
If you have not already done so, you might write to ..... (a company in Minneapolis), as this firm makes hand graining rolls.

Also, perhaps you could grain the top edges of drawers on an off-conveyor operation. In this case the vertical edge graining machine would be installed near the conveyor and the drawers taken off, grained, and then returned to the conveyor. The edge grainers I have in mind and which I saw in operation in several large furniture factories, are positive and extremely fast. They are made by ..... (a company in Louisville, Ky.). In a letter we are giving you these names and addresses.—*P. C. B.*

To Paint Zamak

A new product that we are manufacturing is made of die-cast zamak, which is a zinc alloy. We are trying to get away from plating or etching our zamak surface before painting it. We have tried various types of paints but they all seem to flake off or chip off easily. Do you or any of your readers have any suggestions?—*W.C.*

Our suggestion is to consult manufacturers of cleaning and stripping compounds, many of whom also formulate and sell various metal surface preparation materials. Some of these compounds, added to water and the solution heated, will prepare such metals as zinc and galvanized iron so the surface will take and hold paint satisfactorily. Then there are companies that offer special primer coatings which will adhere permanently to zinc alloys. Advertisements of several of the metal cleaning companies appear from time to time in this magazine.—*Editor.*



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The Chainveyor overhead conveyor system used in this complete finishing process for metal furniture eliminates in-process handling and utilizes the full potential of integrated processing.

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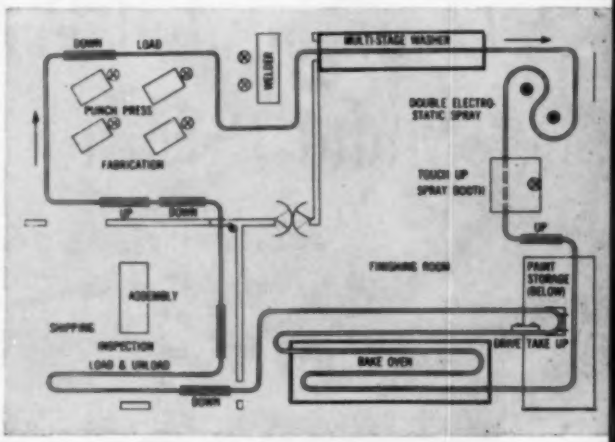
Added flexibility is gained through the use of 6-inch load spacing and a variable speed drive. Job Shop operations assume the characteristics of continuous high production runs. Increased floor space results from the placement of the bake oven and cooling loop near the ceiling.



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Uni-bilt fireplace, as installed in an attractive living room.

Cleaning and Prime Coating Metal Parts for Fireplaces

By Donald S. Jaquith, General Manager
Vega Industries, Inc.*

THE POPULARITY of the factory made Uni-bilt fireplace and chimney can be attributed to smooth, streamlined design and excellent engineering, as well as ease of installation in both new and existing homes. The choice of materials and their treatment plays a big part in making the fireplace as permanent as the building in which it is installed.

Stainless steel is used for the inner flue, damper, soot shelf and trim; aluminized steel is used for the inner hood, baffles and intermediate flue, so you see that any metal contacted by smoke, or subject to high temperatures, has a permanent finish and does not require painting.

*Chattanooga, Tenn. Plant.

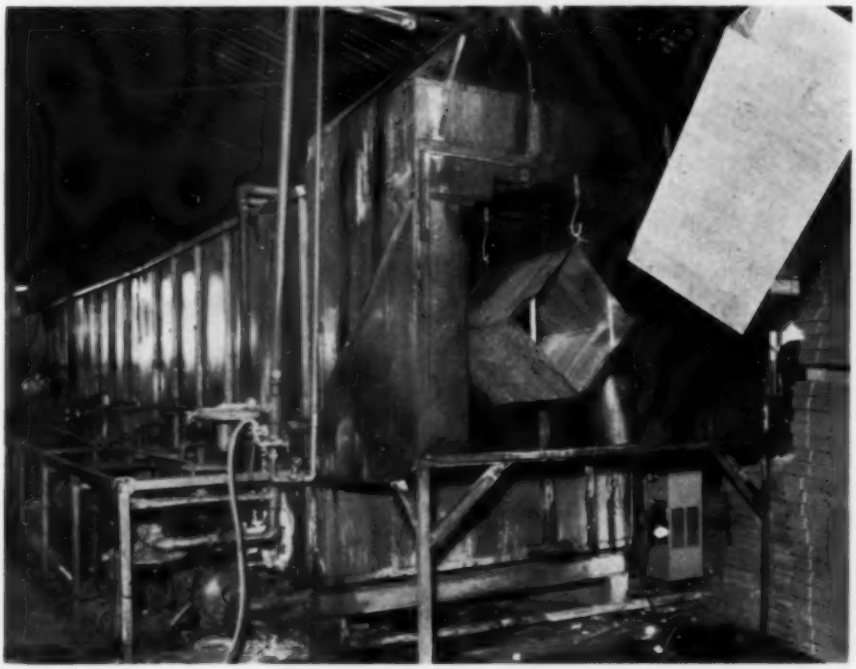
The outer flue casing and the exterior chimney housing are made of zinc coated steel. These two items, along with the outer hood and bottom pan, which are made of cold-rolled steel, are the only parts visible after installation.

Originally we thought of producing the Uni-bilt fireplace in several standard colors, with custom colors available on special order. This plan was soon discarded as being impractical because of the multitude of colors used in interior decorations.

For interiors some people prefer that the fireplace and outer flue casing blend in with the color of the walls or trim, while in other cases a contrasting color is desired. The same applies to the chimney. Due to the design of the fireplace, these parts are not subjected to excessive heat and certainly to no abrasion.

Special paints or high bake enamels are not required. The finish problem was easily solved. We clean and prepare the metal surfaces and apply a zinc chromate primer at the plant. After the fireplace is installed, it may be coated with any type and color of flat or semi-gloss interior enamel that the customer desires. The chimney housing can be painted any color desired. The primed surface offers dependable protection as well as an

Flue casings entering the 3-stage power washer. The dry-off oven is in left background.



This well insulated gas-fired convection oven is located on the roof of the plant. It is used to bake all prime coatings. Roof location leaves added working space in plant.

excellent base for any decorative paint that may be applied.

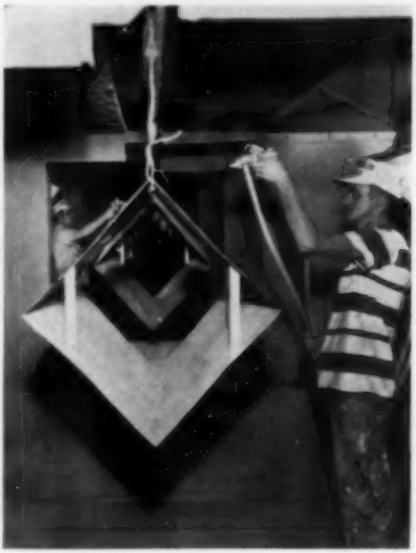
Metal Surfaces are Cleaned and Phosphatized

Since the sections that require a prime coat are rather large, the hooks on the overhead monorail conveyor are spaced 4-ft. apart on centers. The conveyor operates through a variable speed drive at 10-ft. per minute. The metal surfaces are cleaned and phosphatized in a 3-stage power washer. In the first stage, a phosphate cleaner is sprayed on at 180° F. at 25-lbs. pressure; this is followed by a cold water rinse. The same phosphate cleaner is applied in the third stage. Parts are dried for five minutes at 300° F. in a direct-fired gas-heated dry-off oven.

After a cooling period of 20 minutes, the sections enter the first of two reverse position, water-wash spray booths. All surfaces are coated with zinc chromate primer. The atomizing pressure is 65-lbs. and the fluid pressure is 35-lbs.

The primer is taken from pressure tanks each of which is fitted with an air-operated agitator to keep the zinc chromate in suspension at all times. The prime coat is baked in an indirect-fired gas-heated convection oven located on the roof of the plant. Baking time is 13 minutes at 325° F. We obtain a dry film thickness of ½ to ¾-mils. [END]

Steel fireplace sections are coated with zinc chromate primer in these two reverse position water wash spray booths.



Color "Tree" at Design Show

A color "tree," designed to show the color and texture versatility offered by Metal & Thermit Corp.'s recently announced spray-applied vinyl finishes for steel and aluminum, highlighted the product's first public showing at the Design Show, in New York, May 23-26.

Small panels of steel and aluminum finished in many different colors and textures.

Designed by Reino Aarnio, M&T's industrial design consultant, and built by Bryan-Elliot Co., the color "tree" consists of more than 150 coated steel and aluminum panels in 15 colors which span the spectrum. The panels include examples of smooth finishes, chemically produced textured finishes on smooth metal, hi-fidelity finishes on patterned metal and edge-protecting finishes for perforated metal.

According to Mr. Oakley, V. P. of M. & T., the dispersion coatings—organosols and plastisols—exhibit excellent corrosion resistance, toughness, resiliency, and high resistance to scratching, scuffing and abrasion.

Malin and Collins Advanced by DeSoto Chemical Coatings

Edgar E. Malin has been appointed General Sales Manager and John H. Collins has been made District Sales Manager of DeSoto Chemical Coatings, Inc., Pacific Division.

Malin joined the DeSoto organization in 1953 as District Sales Manager for Southern California and Arizona, and has over 20 years of sales experience in industrial paint and coatings. His new headquarters will be at the general offices of DeSoto's Pacific Division in Berkeley, California.

Edgar E. Malin and John H. Collins

Collins joined DeSoto's Berkeley office in 1955 as an industrial sales representative, and has over 15 years of experience in the sale of industrial paints and coatings, primarily on the West Coast. His new headquarters will be in Los Angeles where he will assume the responsibility as District Sales Manager of Southern California and Arizona.

Metal Surface Preparation

A new 2-color folder (8½x11-in.) tells how "Rust-I-Cide" saves labor and avoids replacement costs by removing rust and conditioning metal surfaces.

The variety of applications described includes preparing new metal—including aluminum and galvanized—and rusted metal for painting. Cleaning brass, bronze, copper, nickel, stainless steel, and vitreous enamel.

A copy is available from Rusticide Products Co., 3125 Perkins Ave., Cleveland 14, Ohio.

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Al. Die Castings Color Anodized. Hamilton Die Cast, Inc., of Hamilton, Ohio, has now found the secrets of this problem and is currently making aluminum die castings that are completely color anodizable. The colors are crisp and clean, and can be thoroughly controlled from batch to batch. Furthermore, these colors can be put over three types of basic finishes—satin (scratched like stainless steel), polished bright, and semi-gloss matt.

"Hamiloy," as the Hamilton company calls its group of new alloys, has tensils and yields equal to the standard alloys used in the die casting industry, and has 5% to 7% elongation, as compared to 2% in such regularly used alloys.

Keep your voice calm. Raising your voice when you're excited or angry (which you shouldn't be) is a sure way to make the other person excited and angry.

Defends Orange Peel on Appliance Finish

BROWSING around an appliance store one evening, my attention was directed to a party of 5 or 6 women of various ages, shepherded by a single officious young man who may have been son, husband and brother all wrapped in one. The ladies were interested in refrigerators, automatic washers and driers. They were showing interest in general appearance and convenience features. Their escort was loudly proclaiming his duty to safeguard their selection with his expert knowledge of finishes.

He would sight knowingly across a door or run his hands along the sides of an appliance, and then shake his head sagely. Then he would tell his adoring group, "This one has a lot of orange peel." Guided by this wisdom, the group finally selected some pieces that passed his "orange peel" inspection. When they had gone I went over to inspect their selection. The appliances were of little known make; and the reason that there was no orange peel on the surface, there wasn't enough finish to form any.

My eaves-dropping convinced me that the young man knew little if anything about finishes or finishing. He had heard the word "orange peel" which, being self-descriptive, had stuck in his mind as a plague.

As far back as I can remember the word "orange peel" has haunted chemists trying to build a protective coating—and finishers trying to put

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on a protective finish. It is the favorite rejection device of inspectors who are too blind to see a really fatal flaw. It has been incorporated into specifications by "school boys" blissfully indifferent to the serious limitations of such a prohibition. No matter how ignorant of other things, they know "orange peel."

Personally, I think "orange peel" is much maligned. It should be classed rather as a virtue than a defect. For one thing, it certainly denotes adequate thickness of the protective coating. Like wrinkle or hammer, it masks some sub-surface blemishes. and lastly, viewed dispassionately, is not a delicately dimpled surface as handsome as the monotonously smooth one?—*K. McK.*

P.P.G. Appoints J. F. Green Pacific Coast Manager

John F. Green has been made general manager of Pacific Coast Operations, Paint & Brush Division of Pittsburgh Plate Glass Co. He succeeds Herschel E. Post who will serve as consultant for the company's Pacific Coast Operations until his retirement becomes effective on November 1, 1960.

Mr. Green, formerly manager of the Ditzler Color Division in Detroit, joined Pittsburgh Plate as a clerk in Oakland, Calif., in 1933. He was associated with the Paint Division's operations at Los Angeles and Portland, Oregon, and also served in supervisory positions at Milwaukee and Atlanta.

The ultimate goal is keeping customer trouble calls to a zero point, and guarding ourselves against rejection losses.

Ultrasonic Cleaning of Metal Surfaces

ULTRASONICS, the "science of silent sound," is currently being employed to aid detergents and other dirt loosening mediums in the removal of soil or dirt from surfaces to be painted. Most of us are familiar with the action and application of detergents in metal cleaning, but it will not be amiss to briefly review some current practices.

Soil has been defined as "matter out of place." The nature of this unwanted matter varies.

The problem of cleaning metal surfaces is twofold. First the soil must be dissolved or loosened and then it must be removed. The first step is where the soil can be either dissolved or emulsified — but some substances are not easily soluble. In this event the binding medium that holds the insoluble matter must be attacked.

The second step —the removal of loosened soil — is mechanical. Movement of some kind is called for. The movement may be mild and gentle like a simple flushing, or it may be more or less violent, like using a fast stream or jet of liquid.

We are all familiar with the old hot caustic tank, which served us well in former years. The soils encountered were few. The hot caustic solution attacked the grease, and flushing with clean water took care of its removal. For many organic coatings this simple cleaning was adequate. Today the detergents in use are many and varied. Included are acid and

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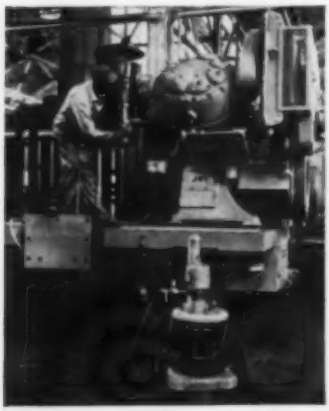
alkali solutions, emulsions and vapors.

To indicate merely the importance of an acid or alkaline solution, water attacks ferrous metals, and alkali does aluminum no good. Thus the selection of a solution is important insofar as it affects the metal being cleaned. The selection of the detergent is determined by the soil to be removed.

Sound, according to the dictionary, is "vibrational energy which occasions a sensation." There are sound waves which vibrate too fast to be distinguished by the human ear; these are known as ultrasonic. They are sound waves and vibrations none the less. These sound waves are best transmitted through a solid or liquid medium, and less perfectly through a vapor medium.

In practice, an electric current is transformed from 110 or 220 volts to a high frequency current. Next the high frequency impulses are picked up by a transducer which transforms the electrical energy into sound waves — mechanical energy. This transducer is placed either at the bottom or on an inner wall of the tank that holds the cleaning solution. The mechanical sound waves are carried through this liquid to the metal surfaces being cleaned.

Effective sound waves for removing most soils are in the upper range of audible sound. This seems to be due to the fact that the lower the vibration rate, the greater the impact or shock of the wave. If the vibrations are audible sound waves they are very annoying and ob-



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SPRAY PAINT IN ASSEMBLY AREAS... WITHOUT OVERSPRAY PROBLEM!

Speed-Up Finishing Work!

Hydra-Spray's elimination of overspray will help you lick the greatest problem in production finishing!

Now you can spray paint in assembly areas without dangerous overspray. Less masking is required and workers can usually work without face masks. What's more, you *save* paint too!

Check these points and see how AIRLESS Graco Hydra-Spray can help you production finish profitably.

- Eliminates overspray and bounce back. Less masking and cleanup.
- Better coverage with *less waste.*
- Usually eliminates the need for worker face masks.
- Simplifies equipment needs.

FOR NEAREST GRACO SUPPLIER { See Sweets Plant Engineering File or phone book Yellow Pages, "Spraying"

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jectionable to workers, therefore most ultrasonic devices are pitched just above audible sound. There are notable exceptions on certain specialized problems, apparently where the soil includes chiefly very fine particles.

It may seem to be simple enough and the principle is not too complex, but due to the different kinds of matter to be removed, and also because of the different metals to be cleaned, ultrasonic cleaning calls for careful investigation of the whole problem.

There are several excellent ultrasonic devices available today. The first transducers could be operated only at comparitively low temperatures—say down around 100° F.—but there are now transducers with a life span of better than one year (and they last longer in operation than in disuse) which will function in solutions heated as high as 250° F.

One manufacturer supplies a device wherein there are two different wave lengths at the same time. This same manufacturer tells us that he has applied ultrasonic vibrations to work in the vapor phase of a vapor degreaser, and the claim is that it facilitates the sloughing off of the soil. Inasmuch as sound (audible) waves transmit through the atmosphere, it would seem logical that the application could be made in a vapor degreaser. It is now possible to either diffuse the ultrasonic impulses or to focus and concentrate them through the cleaning solution, be it liquid or vapor.

For the manufacturer who has a fairly consistent cleaning problem, ultrasonic cleaning presents possibilities. It surely is an interesting and valuable addition to metal cleaning as we have known it.—*C. R. B.*

For more data, circle 199 on colored card.

Better Masking at a Saving in Cost

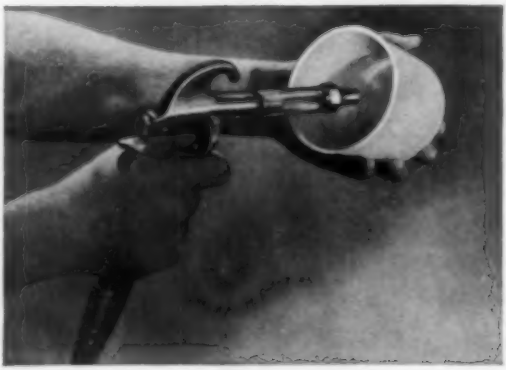
THE SUCCESS OF masking any product for a 2-tone finish or to protect certain areas against the paint—this will depend upon the selection of correct materials and the work of the operator. If the wrong kind of tape is used, masking will not be successful. For instance, a heavy cloth-back masking tape is not suitable for use in the protection of a raised name plate or trademark insignia because it is difficult to mold it closely around sharp radii and close places. A tough, thin-paper-back tape molds easily, is fast to apply and it stays put to do an excellent masking job.

It would be out of order to attempt to use a conventional masking tape if it had to remain on the product while the finish was being oven cured at 250° or 300° F. However, a heat-resistant pressure-sensitive masking tape is available that will withstand oven heat.

Perhaps certain types of the newer resin-based finishes, or the plasticizers used in these finishes, may cause the tape to mark the finish, or may cause a residue after the tape is removed. In some cases a finish material may be heavily loaded with silicones or waxes that could make it difficult for conventional masking tape to adhere successfully to the surface. There are masking tapes made to meet and overcome all of these conditions.

Possibly your masking operation could be improved, either from the

KILL STATIC WITH A GUN!



Simco Ionizing Air Guns will put an end to static woes in any finishing operation! Plastic parts are blown clean, while being neutralized, so that dust, dirt and lint are *completely* removed and will not be reattracted! This new electronic air gun is safe, easy to use, and *guaranteed* effective! Write for facts.

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standpoint of efficiency or speed. Masking tape manufacturers maintain excellent laboratories. Through much research, pressure sensitive tapes and adhesives are continually being improved to meet practically all of industry's special needs and unusual demands.

It might be well for you to make a close study of your masking operations. Perhaps they could be improved, as to their effectiveness, or as to the time it takes to do them, or in reference to the costs involved. Don't be afraid to look into this phase of product finishing. You may discover something interesting.—*R.H.G.*

Don't be afraid of repetition. First state your point. Then give your reason for it. Give an example. Finally, summarize your point with different wording from what you have already used.

Why User Needs a Lab For Testing, Control

MANUFACTURERS of furniture are becoming more conscious of the importance of having a testing and control laboratory owned and used by their plants.

At the beginning, many a small plant can justify a laboratory's expense only in terms of quality control. However, in the long run, staying in business may depend upon having a lab for use in both technical development and testing. As a result of this, many of the large wood furniture manufacturers and some of the smaller concerns have already set up or are considering setting up a lab for quality control testing and research.

Those who have laboratory quality control testing know that it is a practical management tool for scientifically controlling quality. If it is set up properly and used wisely, a quality control lab can supplement the experience already gained by constantly attempting to produce a lower-cost but better quality product. For many companies this can mean the difference between operating a business at a profit or loss.

Plant laboratory quality control in wood finishing enables the user of finishing materials to accomplish the following:

1) Establish control over the incoming finishing materials. All manufacturers of finishing materials have control labs. Most of them do an excellent job of controlling the

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Write for 12-page bulletin illustrating profitable uses and applications. For help with a specific job, Cellusuede's technical service and unexcelled facilities are available for producing samples to meet your needs.
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quality of their products. However, because of the possible human error that can always enter into any manufactured product, some materials do get out to the customer which are not up to the high standards necessary for producing a good quality finish. By having a testing and control laboratory the furniture manufacturer's personnel can check samples from each batch of finishing material and thus detect any defect in the quality of the finishing materials before they go into use on the production line.

2) Enables the user of materials to set up or establish standards for materials needed for each specific suite of furniture and each type of finish.

3) An improvement of production quality. Through testing and research, all application methods and drying schedules may be improved, with a resulting improvement in the quality of the finish.

4) Produce cost savings. Through research, testing and a comparison of what is offered, it is quite possible to find competitive materials that are better in quality and perhaps lower in price. Also, testing and adopting improved procedures result in lower costs.

5) Control over the finished product. The research and testing lab, by controlling the quality of finishing materials, always maintains uniformity of prepared finishing materials in color, adhesion, build and general appearance. This helps to maintain uniformity of quality in the finished product.

6) Greater customer confidence in quality of merchandise. The intangible benefits of a company lab are perhaps harder to define than the tangible results. However, customer satisfaction and confidence in your manufactured product is the ultimate objective of every manufacturer. It

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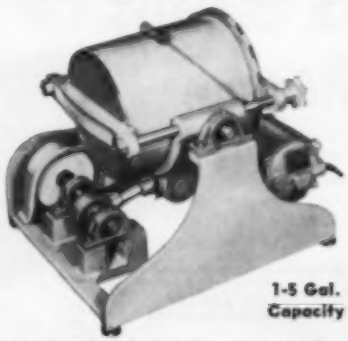

1-5 Gal. Capacity

Model 160 Bull Dog Shaker

Will condition paint to brushing consistency in one to five gallon cans without opening the can. Time required is from two to thirty minutes depending on the paint formulation and the length of time it has been on the shelf. Simply place the can in the saddle, tighten the end plates and flip the switch. Bull Dog will do the rest.

Grenier & Co., Inc.
13142 Rexford St., Blue Island, Illinois

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is of vital importance to every successful manufacturing concern. When your customer knows that you have a quality control lab back of all of your finishing materials, methods and production, then his confidence in your manufactured product will be much greater.—*H. W. Chester.*

Finish Mfr. Receives First "Q" Award

Industry's First "Q" Awards for quality and quantity production to combat increasing foreign competition, inflation and complacency, were presented April 28 to 49 employees and one company supplier by Robert S. Bell, president of Packard Bell Electronic Corp., who expressed the hope that the "Q" program will be adopted by industry nationally as a production symbol for "Made in U.S.A." Bell is shown awarding the first "Q" plaque to Andrew Brown, president of the Andrew Brown Co., Los Angeles, which supplies custom finishes and colors for the cabinets of Packard Bell's home products line. The citation reads: "A notable example of how one company can help another produce better and more."

Andrew Brown (left) receives "Q" Award from R. S. Bell of Packard Bell Elec. Corp.

Removal of All Moisture From Comp. Air Lines

FREE WATER in compressed air lines is a problem to all industry. It is a costly nuisance in almost every application involving the use of compressed air. It causes expensive maintenance, and is often responsible for down-time on the production line.

Many mechanical devices are available to remove condensed water from a compressed air line at any particular point in that line. For example, there are filters, centrifugal devices and float traps. However, they do not get to the basic cause of the water being in the air line.

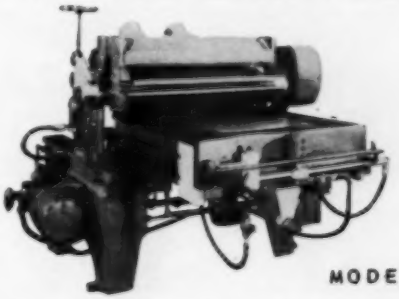
An air compressor draws air from the surrounding atmosphere. Each stroke of the piston draws into the cylinder air plus whatever water vapor occupies this space at that particular moment. This is the one and only source of water that later becomes so much trouble in compressed air lines.

The quantity of water vapor in the atmosphere varies with the weather. There is a limit to the amount of water vapor that can exist in any given space. This is determined wholly by the temperature of the water vapor which is usually the same temperature as the air. These amounts are small in terms of weight per unit of volume or weight per pound of air, so in order to deal with reasonable numbers it is usually expressed in terms of grains per cubic foot or grains per pound

[*Continued on page 120*]

SATISFACTION ALWAYS

WITH CLAIR SURFACE FINISHING MACHINES



MODEL 303

As holds for all TEN models, the table type design shown, incorporates the CLAIR quick-change spindles and the time-tested hydraulic and compressed air circuits. All Clair models are available with the wide choice of options which brings each Clair machine into specific conformance with YOUR individual requirements.

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MANUFACTURING CO., Inc., OLEAN, N.Y.

Offering the Most VERSATILE Line of Surface Finishing Machines

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Add Solvent
AUTOMATICALLY
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Provides more accurate control by eliminating human error.

Improves uniformity of coating.

Reduces labor and material costs.

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OP-AL BURN-IN TOOLS and KNIVES are made of hardened tool steel especially selected for the purpose. The blades are cemented in the handles with ceramic cement to withstand high heat without coming loose from the handles, which are streamlined and well balanced for easy handling.

OPAL THE OP-AL ELECTRIC AND MANUFACTURING COMPANY
3133 MARTINDALE AVE.
INDIANAPOLIS 5, INDIANA

For more data, circle 234 on colored card.

of air. (A grain is a unit of weight. There are 7000 grains in a pound.) Since air compressors are rated in terms of the number of cubic feet of air they are capable of handling, it is best to express the moisture in terms of grains per cu.ft.

The accompanying table shows the maximum amount of moisture that can exist in one cubic foot of space at various temperatures. Note how rapidly this amount increases as the temperature of the air is increased.

Temp. °F.	Maximum Moisture Grains per cu. ft.
0	0.47
20	1.24
40	2.80
60	5.90
70	8.30
80	11.45
90	15.7
100	21.7
120	39.2
140	72.0
160	134.0
180	285.0

Any mechaanical device for removing moisture, when placed at a point in the line, can only remove the water that is produced up to that particular point. Any line continuing from that point of removal and all lines branching out therefrom will be subject to the deposit of free water as the air progresses through the system.

One logical approach to the removal of this nuisance is to cool the air in the system at some point before the first point of use. To do this effectively requires the use of a cooling medium considerably below the lowest temperature to which the lines will be exposed. Mechanical refrigeration is an ideal answer to this problem.

Complete removal of free water from the compressed air lines requires only that the air be cooled down to a temperature below the minimum temperature to which the lines will be exposed in any subse-

quent travel through the distributing system. The water condensed out of the line must be removed at the point where cooling takes place.—*D. T.*

Water - Soluble Baking Enamels. News of interest comes from AB Wilh. Becker of Stockholm, Sweden —of phenolic and melamine resydrols used for making bake primers, primer surfacers and top coats.

These baking enamels, called Laqva, are made from water-soluble resins. Laqva can be built up on a phenolic or a melamine basis and gives proper solution with water.

The difference between phenolic and melamine based materials is fundamentally the same as in conventional systems, though in some cases other interesting properties have been obtained.

Laqva primers on a phenolic basis can be used on steel, aluminum, zinc and bronze. They have good adhesion and corrosion resistance on outdoor exposure; also they have excellent impact resistance and good flexibility.

The flow of these paints is extremely good and there is practically no danger of film defects such as sagging. They may be applied by spraying, dipping or roller coating.

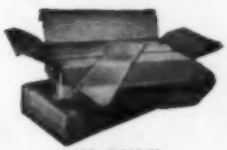
Baking requirements for the phenolic based paints are 30 minutes at 320° F., or 20 minutes at 340° F. For the melamine paints the schedules range from 60 minutes at 250° F. to 15 minutes at 320° F.

Before baking, the film must be allowed to air dry in order to let most of the water evaporate. The baked primers can be sanded wet or dry.

Detection of errors on raw materials can prevent chaos in production of small parts.

For Dust Free Finishes!
BOND TACK CLOTH

IN ROLLS
Cut off any size piece to use as needed.



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A SPECK-FREE FINISH EVERYTIME
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No matter which way you buy it, you can be sure that every square inch will stay SOFT and TACKY until the very last bit is used up! Choice of Standard, Extra Tacky or Less Tacky as desired.

The Cut Bulk size is 18" x 36" . . . folded to 4½" x 18" or 9" x 18" for ease of handling. ALL BOND TACK CLOTH is **Spontaneous Combustion Proof, Lint-Free** and **Wax Free.** Gives a sparkling speck-free Finish every time. Clean and sanitary. No waste.

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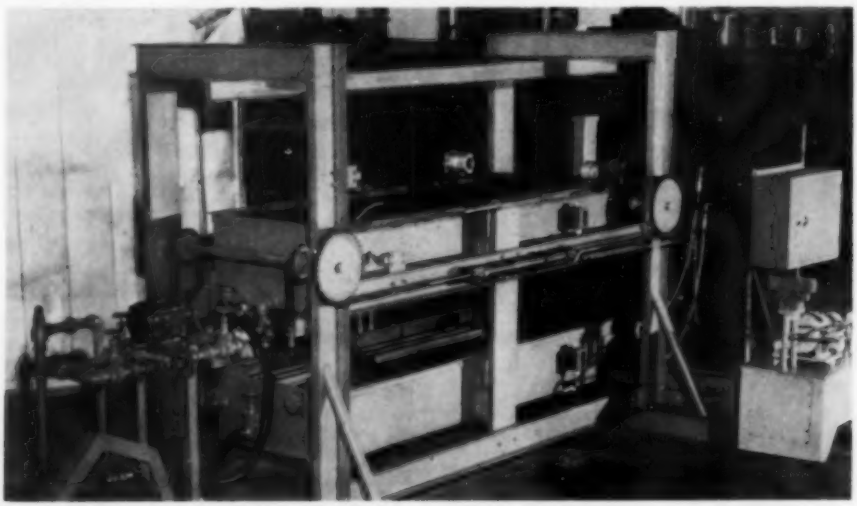
Dip Tank Moves Vertically to Coat Conveyor-Hung Parts

Floor space can be saved through a new dipping system, in which a dip tank for applying insulating varnish to electric motor stators and windings, automatically moves upward to immerse the work, then recedes to enable the latter to continue onward by conveyor. The machine provides control of work withdrawal and constant level of varnish at all times for positive and thorough coating. It is flexible enough so the conveyor can be halted over the tank to allow a longer period of work drainage, if necessary.

The system, which revolves about a new concept of dip tank operation, was developed by design engineers of The R. C. Mahon Co.'s Industrial Equipment Division, Detroit 34, Mich. According to the company, it also may be used effectively as part of a dip painting operation in many plant finishing departments.

Two short tanks, one over the other, are used to do the work with great efficiency. Both tanks, which are only 8-ft. long, are built into an operating unit (including hydraulic and varnish circulating systems) that occupies a floor area of only 6 feet wide by 14 feet long.

As in conventional procedures, the conveyor from the preheat oven runs over the upper or dip tank of the



The dip tank moves up and down to immerse parts hanging from conveyor (not shown here).

system, but is designed so it can be stopped to "spot" the work (suspended from hangers) directly over the dip tank for immersion.

When the conveyor stops, it triggers a limit switch and the upper tank (in lowered position) rises to immerse the work. As this movement takes place, the lower or varnish storage tank moves downward. After immersion, the upper tank lowers automatically and the lower tank rises, the two almost meeting.

The lower tank serves as a counterweight in the movement; it also keeps the varnish in the dip tank at proper level, and holds the coils to cool the constantly circulated varnish.

Movement of the tanks actually is effected through a hydraulic cylinder, piston and chain drive arrangement, with speed controlled through hydraulic valving.

The system also includes an electric eye control to provide for a wide range of immersion. The dip tank moves up a maximum of 13-in. which allows immersion up to 9-in.

Although rise, submersion and withdrawal times are adjustable, the dip tank for varnish applications rises in 6 seconds normally. The work is submerged for 7 seconds, and withdrawal time is 58 seconds—the same time it takes the conveyor to move forward to spot another load.

For more data, circle 1 on colored card.

Aluminum Cleaner-Etchant and A Peel-Off Coating

Two new product developments for the metal working industry have been announced by DuBois Chemicals, Inc., 634 Broadway, Cincinnati 2, Ohio. They include an aluminum etchant "A-612" and "Zip-It", a low-cost, plastic, paint spray booth mask.

A-612 is a modern, powdered aluminum etchant, formulated to produce satin-like finishes. Special sequestering agents in A-612 give greater control during the processing.

DuBois chemists say that A-612, used in concentrates of 2-oz. per gallon of water is excellent for cleaning and etching. Improve smut control, a reduction in tank scale build-up and tank sludge, and controlled foam blanket are noticeable, they say.

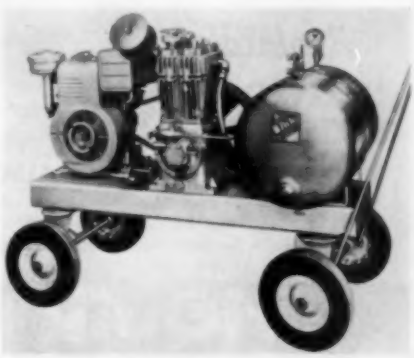
Zip-It, according to DuBois chemists, is a new DuBois development for metal men who want a low-cost, plastic coat without regard for fire safety. Zip-It, DuBois officials remark, should be used as solvents are used in paint rooms. DuBois offers a similar plastic coat with non-flammable qualities, called Peel Filmite. Zip-It is easy to use and can be sprayed on with regular spray equipment.

For more data, circle 2 on colored card.

High Capacity Air Compressors

A new line of high capacity, heavy-duty portable air compressors is announced by Binks Mfg. Co., 3116 Carroll Ave., Chicago 12, Ill. It includes six portable units and a stationary unit.

The portable units are equipped with Briggs & Stratton Model 23AB gasoline 8-hp. engines. The compres-



4-Wheel model of the new compressor line.

sor is a 2-cylinder, single stage, pressure lubricated model equipped with constant speed unloader, a 20-gallon ASME 150-lb. W.P. air receiver, safety valve, pressure gauge, drain, and two shut-off valves.

Actual air delivery of the portable units is 24.5 cfm. Each of the portable units will handle up to four spray guns, depending on nozzle combinations. The tank-mounted unit is a 5-hp. model. The compressor delivers air at the rate of 21.5 cfm. at 100-lb. pressure.

Operation on the stationary unit is automatic; a pressure switch maintains tank pressure to pre-set limits, so that the compressor is started and stopped automatically, based on air demand. The compressor is equipped with an 80-gallon ASME 125-lb. W.P. air receiver, complete with safety valve, tank drain, shut-off valve, and air gauge.

For more data, circle 3 on colored card.

Liquid Polymer Epoxy Resin Coatings Provide Durability

A series of new protective coatings that exhibit high chemical, solvent and abrasion resistance has been developed by Cosden Paint Co., Beverly, N. J. The coatings are made of polysulfide liquid polymers and epoxy resins, both film formers in their own right. The liquid polymers form flexible, elastomeric films with high resistance to solvents and weathering. The epoxy resins provide hard, chemical-resistant films which adhere tenaciously to many types of materials.

The Cosden LP/epoxy coatings are available in several formulations ranging from solvent systems to 100% solids. Even special systems are available for coating wet concrete and wood, damp rusty steel and the like. They may be applied by spray, brush, dip, roller or flow coating. Most of the coatings cure readily over a broad

1
Make Your Old BULB-TYPE OVEN
More Efficient by Installing
2
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F. R. Assemblies
Replace
IN TWO
EASY STEPS
TEMPERATURE CONTROL, ALSO
With the change-over you can enjoy accurate control; from 0% to 100% of rated capacity. Write for literature giving complete data.
You can free yourself from the expense of replacement of burned-out infra-red bulbs by installing dri-Quik F. R. Assemblies. These units fit into your present oven and enable you to save most of the cost of a new oven. Take advantage of greater efficiency of driQuik ceramic-type generators.
driQuik
DIVISION
DRY CLIME LAMP CORP.
GREENSBURG, INDIANA

For more data, circle 205 on colored card.

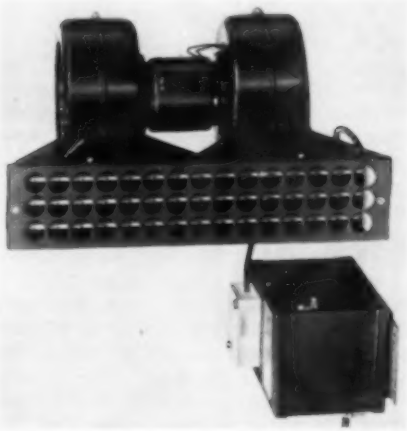
temperature range to as low as 40°F.

The applications for these LP/epoxy coatings are infinite. They range from clears to trowelable compounds for patching concrete floors. They are well-suited for general maintenance; equipment and structures exposed to corrosive chemicals, solvents, etc.; electrical insulating coatings; marine applications; non-skid surfacing; electrical conducting coatings and patching compounds.

For more data, circle 4 on colored card.

Long Range Static Eliminator

Aerostat is the name of a new device designed to automatically eliminate static electricity. The device incorporates a static neutralizer head in the air outlet of a centrifugal blower and is said to neutralize static at distances of up to 4-ft. on materials passing through the air stream. The ionization which causes the static elimination is produced in the static neutralizer head and is carried over these distances in the air from the blower. [*Continued on page 126*]



Air from round openings eliminates static.

COLD DEGREASING FOR ANY PRODUCT!

"Non Flammable"—Low Cost—Easy To Use

REMKLEEN WS

A Clear Fluid . . . Degreases Fast

RINSE, SPRAY OR DIP

REQUIRES NO WATER, HEAT, STEAM OR POWER NOR EXPENSIVE EQUIPMENT

REMKLEEN WS produces a chemically clean surface for immediate painting, coating, processing, welding, etc. REMKLEEN WS eliminates the fire hazards of solvent cleaning and lowers insurance costs.

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REgent 9-1031
Serving Industry Since 1924

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Ask About

GRAINING

with plates or cylinder machines

Used for twenty-eight years by leading manufacturers for reproduction of wood grain on wood, hard-board and metal.

AMERICAN RICHWOOD PRODUCTS CO.
Graining Plate Division
104 E. Mason St. Milwaukee 2, Wis.

For more data, circle 236 on colored card.

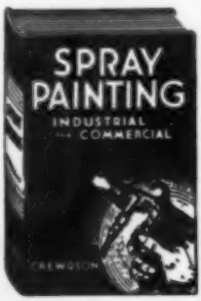
Prillaman Drawer-Glide Waxes penetrate deep into pores of the wood, thereby giving the drawers dimensional stability, a moisture-proof coating and lubricating the surfaces for easy sliding. They also beautify the wood and give surfaces a smooth, waxy feel. Supplied in color or colorless to be applied by spray, brush, sponge or dipping.

THE PRILLAMAN CO.
MARTINSVILLE, VIRGINIA

For more data, circle 237 on colored card.

—SPRAY PAINTING—
INDUSTRIAL AND COMMERCIAL
Contains 183 pages. Fully illustrated.
Cloth. Price $2.50

This new book covers the fundamental principles of spraying technique, together with the latest developments and practices of this craft. Covers common paint pigments, paint extenders, enamels, oil and spirit varnishes, shellac, lacquer, synthetics, all types of modern air guns, spraying technique, spraying standard materials, spraying defects, their cause and remedy, flock and suede finishes, striping and lettering, pearl lacquer finish, also automatic spraying, electrostatic spraying, agricultural spraying and automobile spraying. Ends with the sprayers' "Ten Commandments."



INDUSTRIAL FINISHING
1142 N. Meridian St. Indianapolis 4, Ind.

It is available in two sizes, 10-in. and 20-in. For larger parts and wider materials, several units may be combined to create a continuous neutralizing field.

The Aerostat will eliminate static on large plastic parts—even those with deep indentations and intricate shapes—molded pieces that require both the outside and inside be neutralized; also it serves well for tumbling and deflashing operations to prevent dust attraction. It is useful at the delivery presses with "fly" delivery when running sheet stock, plastic sheets and materials that sometimes become charged by air friction "on the fly."

The manufacturer is The Simco Co., 920 Walnut St., Lansdale, Pa. **For more data, circle 5 on colored card.**

Infrared Sections by Fostoria

You can now build your own infrared oven with prefabricated Fostoria infrared sections, separators and baffles. Designed on the erector-set principle, all parts are pre-drilled for quick easy assembly.

Fostoria infrared sections are the same as those used in many large pre-assembled Fostoria ovens. Patented gold-plated wide-angle reflectors provide high efficiency, keep operating costs low. Durable two-wall construction assures long lamp and socket life. No additional oven insulation is required. Sections are pre-wired in accordance with National Electric Code standards.

Since sections accommodate 125, 250, 375 or 500-watt G-30 lamps, heat output can be increased or decreased simply by using the proper size lamps for the job to be done. Where even closer control is desired, input controllers (percentage timers) can be incorporated in the oven circuit to

"dial" heat output at any level from 26% to 100% of rated lamp capacity. Additional control of the heating cycle can be secured through the use of timers to automatically turn off or reduce heat at the end of the cycle. *—Fostoria Corp., Fostoria, Ohio.*

For more data, circle 6 on colored card.

The Fluidized Bed Process of Coating Metal Parts

Armstrong Epoxy Resin Coating powders are especially formulated for coating objects by the fluidized bed coating process.

The coating process consists of dipping an object, which is preheated above the fusion temperature of the resin powder, for a few seconds into a bed of the resin powder. The powder is kept in a fluidized state by an ascending current of air or gas.

While in the fluidized state, the powder is in loose contact with all surfaces of the object to be coated. Items to be coated are easily dipped and removed from the bed.

Upon contact with the hot object, the powder partially fuses and clings to the surface. The powder may continue to fuse to a uniform film after withdrawal from the bed—or additional heating for a few minutes may be necessary to obtain smooth, uniform coatings.

Thermosetting powders, such as the epoxies, require a curing operation to convert them to insoluble, infusible coatings, whereas the thermoplastic powders such as polyethylene or nylon are already in their final chemical state and, hence, need no further curing. Coating various objects by the fluidized bed process offers the following features.

1) Removes the need for solvents.

2) Is adaptable for automatic processing. [*Continued on page 128*]

MULTI-COLOR WOOD GRAIN PRINTING REPRODUCES FULL Natural Beauty

All of the delicate shadings of the world's most handsome selected wood grains are faithfully reproduced on close-register HAMANT DV-27 Productwin Graining Machines. Printing in two colors over a third (ground) color, gives a truly natural appearance which cannot be duplicated by ordinary methods. Can print assembled work up to 40 inches high.

hamant
GRAINING MACHINES

FOR COMPLETE INFORMATION WRITE OR PHONE

The HAMANT TOOL COMPANY, Inc.
502 Warren Street • BAldwin 4-4838 • Dayton 9, Ohio
IN CANADA: Cooper & Horton, Ltd. • Toronto, Ont.

BRINGS THE POSSESSION OF BEAUTIFUL FINISHES WITHIN THE REACH OF MILLIONS

For more data, circle 206 on colored acrd.

3) Film thickness up to 3/16-inch thick is obtainable in one or several dips.

4) Excellent edge and corner coverage due to built-in flow control.

5) Does not require expensive equipment.

6) Can be adapted to a wide variety of sizes and shapes.

7) Permits the use of coating materials which heretofore have not been applied satisfactorily.

Further information can be obtained from Armstrong Products Co., Warsaw, Indiana.

For more data, circle 7 on colored card.

Small Enclosed Automatic Spray Painting Machine

A new brochure describes and illustrates a pressure contact spray painting machine that has new features including enlarged plenum chamber, accurate variable speed oscillation, air filter, automatic trap, and adjustable spraying time.

Standard models have single and double stationary or single and double oscillating guns. They may be all air operated or explosion-proof motor driven, and may be had with included mask washers.

Write Conforming Matrix Corp., 331 Toledo Factories Bldg., Toledo 2, Ohio, for brochure on Model EPC20.

For more data, circle 8 on colored card.

New Airless Spray Coating Pump Announced by Aro

A new line of airless spray coating pumps, designed for industrial production line coating applications and for wide-area coverage, has been developed by the Aro Equipment Corp., Bryan, Ohio.

The spray units supply coating materials to spray guns at a hydrau-

Aro's portable airless-spray-painting unit.

RECOVER your Paint Overspray

• REPROCESSED in our plant to conform to its original specification, in both physical and chemical properties, paint waste overspray or sludge can be used again in regular production at considerable savings. Our more than 21 years' experience is customers' guarantee of satisfaction.

PRIMERS—WHITES—COLORS—

Mixed color sludges can be converted to primers.

• Write for complete details!

W. C. RICHARDS CO., 3108 W. Vermont St., Blue Island, Ill.
California Plant: 401 Julianna, Anaheim, Cal.

For more data, circle 207 on colored card.

SYNTHETIC
PEARL ESSENCE

RONA™ FOR
PEARLESCENT FINISHES
BAKE OR AIR DRY
For Your Product Made of Metal, Plastic, Wood or Glass,
Write for sample, Specify application; choice of vehicle.
RONA PEARL CORPORATION
A Division of Rona Laboratories, Inc.
East 21st and East 22nd Sts., Bayonne 2, N. J.
Plants: Maine New Jersey Canada

For more data, circle 208 on colored card.

lic pressure estimated at 20 times the air supply pressure. This, according to Aro, virtually eliminates fog and overspray since the coating material "floats to the work surface."

Do to the absence of overspray, savings in paint up to 50% have been reported. In addition, the new Aro unit minimizes the need for exhaust equipment, drop cloths and masking, according to the manufacturer.

Another feature claimed for the new Aro process is a substantial reduction in the number of applications required to protect the area being sprayed. One coat of material applied by the new airless method is said to provide a heavier mil thickness, in many cases, than two coats of conventionally-applied material.

One of the new Aro pumps is said to be capable of covering 10,000-sq.ft. of flat surface in 11 minutes.

For more data, circle 9 on colored card.

Wide-Face Buffing Wheel

A new wide-face wheel head, specially designed for continuous buffing of aluminum, brass or steel coil stock, has been added to Murray-Way's line of specialized polishing and buffing machinery and complete automatic production lines. Murray-Way Corp., P. O. Box 180, Birmingham, Mich.

For more data, circle 10 on colored card.

TOMORROW'S Products Tested TODAY
A service to aid industry in producing longer-lasting and better-looking products. Quick predetermination of durability and permanency by actual exposure test in South Florida. Write us today for full information.
SOUTH FLORIDA TEST SERVICE
EST. 1931
4301 N. W. 7th St. Miami 44, Fla.

For more data, circle 238 on colored card.

Durable Vinyl Coating That's Easy and Quick to Apply

Structural steel and other metal fabrications subject to chemical attack and weathering are easily made durable and economical to maintain with a spray coating based by Bakelite brand vinyl resin.

This vinyl coating has exceptional dielectric properties, making it an excellent electrical insulator. The Sun Oil Co. has had success in the use of the vinyl coating called Quelcor No. 418 as a protective coating for instrument housings, instrument tubing and fittings. Sun Oil also has been able to utilize the various colors that are available for color coding of instrument tubing.

Vinyl resin-based coatings resist most petroleum fractions, gasoline, greases, acids and solvents. Applied to a surface that is clean, dry and free of scale, the coating, formulated with a built-in primer, dries to a

tough, durable film which improves appearance in one quick operation. It forms a smooth film—touch dry in as little time as one hour—that adheres tightly to many porous and non-porous surfaces.

Spray coating of larger areas can be accomplished by conventional pressure pot equipment. However, for the maintenance engineer, Quelcor furnishes this air drying resin-base coating in handy aerosol containers.—A product of Quelcor, Inc., Front and Broomall St., Chester, Pa.

For more data, circle 11 on colored card.

New Multi-Color Grainer By Hamant Tool Co.

The Hamant Tool Co., 502 Warren St., Dayton 9, Ohio, manufacturer of graining machines, has developed a new "Add-A-Unit" Model MC H-158 multi-color type of graining machine. This machine may be purchased as a complete multicolor outfit, or it may be started as a one color master unit and more units may be added at a later time.

Although this model is designed principally for use in printing plywood and hardboard sheets, it may be used equally well to print thin sheets of plastic or metal, or to print panels and built-up structures up to 8-in. thick.

Once set up, production speeds up to 125-ft. per minute may be obtained. Operation is quiet and free from vibration. The new positive feed does not depend upon follow-up blocks.

These multiple-unit graining machines are capable of close-register printing which reproduces the actual appearance of selected wood grains with unusual fidelity. The addition of the undertone wood colors printed just as they apear in the actual wood, gives the same warm natural effect as in the wood itself.

For more data, circle 12 on colored card.

Dobeckmun "Metalflake Process"; New Metallic Colors

A major development in automobile paint—an entirely new realm of metallic colors—has been introduced by The Dobeckmun Co., a division of Dow Chemical Co.

Achieved through the use of Dobeckmun's Metalflake, the futuristic finish has been applied in gold to a 1960 Chrysler New Yorker.

The Metalflake—tiny particles of precision-cut decorative flakes made from coated aluminum foil—is available in red, green, blue, silver and copper, as well as gold. It is produced in a wide variety of shapes and sizes, ranging from dust-like grains to larger squares, geometric shapes, stars and cut threads.

The most minute size yet achieved by Dobeckmun—rectangles precision-

385 million Metalflake particles in 1-lb.

CHEMICAL FORMULARY

Volume X

Compiled by a Staff of Experts

Editor-in-Chief, H. BENNETT

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The Volume X of THE CHEMICAL FORMULARY is a collection of up-to-date formulae compiled by the country's leading industrial and research chemists in each field of industry.

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1142 NORTH MERIDIAN STREET INDIANAPOLIS 4, IND.

Volumes 1-9 also available

cut to the almost unbelievable measurements of 1/130th of an inch by 1/230th of an inch—are used in the paint.

The material is sprayed onto the body and covered with a thick layer of lacquer. Because the Metalflake chips land in haphazard patterns, they create a luminous, three-dimensional reflected effect. This reflection causes the paint to take on different hues and tints, depending upon the angle from which it is viewed.

Other special colors and effects can be created by the use of different combinations of Metalflake and lacquer.

Metalflake is a relatively new product by Dobeckmun and has been used to add glamour to a multiplicity of products. Dobeckmen Co., Div'n. of Dow Chemical Co., P. O. Box 6417, Cleveland 1, Ohio.

For more data, circle 13 on colored card.

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P. O. BOX 631 — TOCCOA, GEORGIA

For more data, circle 239 on colored card.

Six New Finishing Processes Announced by Allied Research

Allied Research Products, Inc., 4004 Monument St., Baltimore 5, Md., manufacturer of metal finishing processes and equipment, announces the addition of six new finishing processes to its line.

Three of these new formulations are Iridite chromate conversion coatings for providing corrosion protection, paint base preparation and final finishing of non-ferrous metals.

The new Iridites are designated as 1P, 7P and 11P. All are manufactured in powder form, thus providing the user with less storage space requirements, lower freight cost and lack of returnable containers and deposits.

Iridite 1P is a powdered version of the original Iridite No. 1 (olive drab) which was developed in 1943 as a corrosion resistant finish over zinc and cadmium for military use. This new powdered compound provides the same advantages of corrosion protection, paint adherence and final finishing as its liquid counterpart, but offers easier solution control. This material produces a dark green, olive drab film on zinc plate and a similar film, having a brown cast, on cadmium plate.

For more data, circle 14 on colored card.

WOOD GRAINING MACHINES

6-inch to 60-inch printing widths.
Models for every direct-printing application.

KENT ROTARY EQUIPMENT COMPANY

1507 So. Downey Road — **Los Angeles 23, California**
Cable: KENTRO, Los Angeles — **Phone: ANgelus 1-5632**

For more data, circle 209 on colored card.

FAST STRIPPERS *(For Metal Parts)*

Enamels • Lacquers • Primers • Vinyls • Synthetics

LEA SYNSTRIP...a fast working, non-corroding liquid, enamel, lacquer and synthetic coating stripper. Will not attack aluminum, zinc or any other base metal or alloy; does not dissolve the coating but breaks the bond. When heated to temperatures of 160° to 200° F., stripping synthetic coatings of the alkyd, epoxy, phenolic, silicone and urea type, is accomplished in a matter of seconds.

LEA COLDSTRIP...high speed stripper used at room temperature; only minimum ventilation; can be filtered for continued use.

SEND FOR COMPLETE DATA and FREE TEST SAMPLE

The LEA Manufacturing Co.

16 Cherry Avenue, Waterbury 20, Conn.

For more data, circle 210 on colored card.

New Tumbling Equipment

Tumb-L-Matic, Inc., St. Mary's St., Stamford, Conn, designer and manufacturer of tumbling equipment, is offering a new barrel finishing unit for producing fine finishes on metal and plastic precision parts.

Designated Model XLC-2120, the barrel is mounted in a welded iron frame and supported in oversize bearings at each end of the shaft. The hexagonal barrel is 20-in. in diameter, 21-in. long and lined with ¼-in. thick Neoprene.

The barrel can be supplied unlined or lined with abrasive-resistant rubber. The XLC-2120 can be utilized for wet or dry processes.

The gear head motor drive has a 24-hour continuous rating and operates through a chain to the barrel shaft.

For more data, circle 15 on colored card.

New Primer Improves Coverage Uniformity

A new metal primer coating is said to provide complete coverage of all metal surfaces, particularly over weldments, sharp edges and other protuberances.

The new primer, called Clo-Flex 621, produced by Harrington Paint Co., Inc., 1644 Collamer Ave., East Cleveland 10, Ohio, utilizes a unique molecular hydrocarbon structure which is said to be compatible with practically all finish coatings.

The prime-coated surface has excellent resistance to salt and chemical attack, abrasion and chipping. Under standard ASTM 300-hour salt-spray tests, the new primer showed no deleterious effects. No color change was noted following exposure to such compounds as 5% nitric acid, 50% sulphuric acid and 5% hydrocloric acid.

Clo-Flex dries to a tack-free finish in 15 minutes under average ambient temperature and humidity conditions. It can be force dried in three to five minutes. [*Continued on page 134*]

COMPRESSED AIR DRYERS

EXTRACT WATER AND SCALY PARTICLES—STOP PITTING IN AIR SPRAY FINISHING

Van-Air DRYER

Operating for less than 1c per 16,000 cubic feet, VAN-AIR Dryers clean and dry compressed air to ZERO dewpoint—reduce spoilage in spraying, blasting, plating, drying, agitation, etc. Many capacities. Ask for brochure.

VAN PRODUCTS CO.

5744 SWANVILLE ROAD, ERIE, PA.

For more data, circle 240 on colored card.

The new material is said to have an indefinite pot life, is suitable for primer uses on most metals, and has been used for coating rubber, wood and other materials as well.

For more data, circle 16 on colored card.

Protective Hand Cream

Glovs, a new hand cream designed to protect workers skin against the harmful effects of harsh chemicals in paint, lacquer and industrial inks has been developed by National Lacquer & Paint Co., 7415 S. Green St., Chicago 21, Illinois.

This uni-process cream encases the hands in a protective coating which resists the irritating abrasive action of dirt, dust and powders and the injurious effects of chemical substances and grease on the skin, yet rinses off quickly with use of mild soap and water.

A free large size container of Glovs, to try out in your plant, is available from the manufacturer on request.

For more data, circle 17 on colored card.

High-Gloss Coating For Stretch Rubber

A coating with a "memory" has been developed by Cosden Paint Co. for restoring high gloss to rubber products dulled by manufacturing processes. The coating, a clear polyurethane, has the ability to elongate as the rubber stretches and then return to its normal state without cracking or checking.

Developed for use on rubber footwear, the coating has a high resistance to scuffing and abrasion. It can be applied by spraying or dipping and then cured for 15 minutes at 225° F. or the equivalent.

For complete details, write to Cosden Paint Co., Beverly, N. J.

For more data, circle 18 on colored card.

Wood Grain Printer

Reproduction of wood grain, which is so authentic that it can hardly be distinguished from the natural wood grain, can now be faithfully printed on plywood, hardwood, particle board, metal, paper, and other surfaces with a Morrison Wood Grain Printer, available in single or multi-color models. This new machine offers exceptional versatility combined with many other advanced features engineered to simplify operation and provide printing fidelity. The proper use of the machine permits you to add the lasting beauty and enduring sales appeal of the finest woods to your products.

Flat panels or completed cabinets, desks or other furniture can be printed.

In minutes it is possible to change from one wood grain to another. An important feature of all Morrison Wood Grain Printers is the ease and speed with which the printing cylinders are changed.

There are bound to be variations, no matter how minute, in the thickness or flatness of the material being printed. To automatically compensate for these variations, the Morrison Wood Grain Printer uses a flexible composition roller which is virtually unaffected by humidity and temperature variation. The grain impression is transferred from the chrome-plated intaglio cylinder to this flexible roller which, in turn, transfers the impression to the surface to be printed without loss of fidelity.

A 4-page bulletin 8½x11-in., shows 12 samples of grain printing and the four models of this machine. M-H Standard Corp., 515 Communipaw Ave., Jersey City 4, N. J.

For more data, circle 19 on colored card.

For Your Convenience

Use INDUSTRIAL FINISHING magazine's "Reader Service" return cards to obtain further information on products described and illustrated in the "Materials; Supplies; Equipment" section which precedes this page; also to receive further information on what manufacturers have to offer—literature, products, supplies, services, etc., as mentioned on the following pages.

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Industrial FINISHING

June, 1960, Issue

READER SERVICE DEPARTMENT

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What Manufacturers Offer--Literature, Materials, Equipment, Supplies, Services

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Some of the returned cards we receive are not filled in correctly—and we cannot read a few of the hand written names and addresses. Before returning a card, please check to see if it is marked correctly—and legibly, including your name and address. Thank you.—*Editor.*

Burn-in Tools for making quick and skilful repairs to nicked, dented or scratched finishes. The Op-Al Electric & Mfg. Co., 3133 Martindale Ave., Indianapolis 5, Ind.
For more data, circle 21 on colored card.

"Spex" Multicolor One-Coat Finish is featured by V. J. Dolan & Co., Inc., 1830 N. Laramie Ave., Chicago 39, Ill. Provides a combination of two or more harmonizing colors in one coat with standard spray equipment. For finishing wood, metal, plastic, brick, concrete and all types of composition board. Dries like lacquer. Hides surface irregularities. New 1960 color card showing assortment of sprayed (not photographed) multi-color combinations available.
For more data, circle 22 on colored card.

Static Eliminator. Simco Ionizing air guns will put an end to static woes in any finishing operation. Plastic parts are blown clean while being neutralized, so that dust, dirt and lint are completely removed and will not be reattracted. The new electronic air gun is safe and easy to use; guaranteed effective. The Simco Co., 920 Walnut St., Lansdale, Penna.
For more data, circle 23 on colored card.

Multi-Color Wood Grain printing reproduces the world's selected wood grains. These grains can be reproduced on the close-register Hamant DV-27 Production Graining Machine. Prints in two colors over a third (ground) color. Gives a natural appearance which cannot be duplicated by ordinary methods. Can print assembled work up to 40-in. high. The Hamant Tool Co., Inc., 302 Warren St., Dayton 9, Ohio.
For more data, circle 24 on colored card.

Tailor Made Finishes for wood surfaces include every product necessary to lend enduring beauty to wood. The Industrial Finishes Division of Gilman Paint & Varnish Co., Chattanooga 1, Tenn., has been serving the industrial southeast since 1910. A satisfactory finish can be supplied for your wood products.
For more data, circle 25 on colored card.

Industrial Finishes, specially formulated for your production line and products, give your products a salable appearance. For a perfect protective and decorative finish for your purpose, consult the Rockford Varnish Co., Rockford, Illinois.
For more data, circle 26 on colored card.

No. 2 Process Electrostatic Hand Gun by Ransburg Electro-Coating Corp., Box 23122, Indianapolis 23, Ind., saves paint because there is no waste. Saves labor and increases production because it is faster due to the "wrap around" nature of electrospray which paints all sides of tubing, rod and wire from one side only. Saves on equipment because no spray booth is necessary; no compressed air for atomization.
For more data, circle 27 on colored card.

Armorhide Coating is a tough, textured finish resembling leather. Has good abrasion and chemical resistance. Can be applied to assembled metal parts and products; covers all edges making them smooth and free from sharpness. Sprayed and fused on the metal, it is applied at high solids in a thickness of 10-15 mils coating. No solvents are required. Armorhide bulletin and sample panel are available. John L. Armitage & Co., 245 Thomas St., Newark, N. J.
For more data, circle 28 on colored card.

Flow and Dip Coaters, spray guns, industrial ovens, hot spray systems, spray booths, industrial washers and automatic spraycoaters are just a few of the DeVilbiss Co.'s line of coating and finishing equipment. Determine the best method and equipment for surface preparation and coating then contact The DeVilbiss Co., Toledo 1, Ohio, for complete information, suggestions and installation.

For more data, circle 29 on colored card.

"Remkleen WS" is a cold degreaser for any product. Rinse, spray or dip your product in Remkleen WS and it produces a chemically clean surface that can be coated or processed immediately. No special equipment necessary. 5-gal. can at drum price. R. & E. Martin, Dept. J-O, 2817-21 Helen St., Philadelphia 34, Penna.

For more data, circle 30 on colored card.

Guardsman Furniture Finishes by Grand Rapids Varnish Corp., Grand Rapids 2, Mich., add beauty and salability to your furniture line. Let a Guardsman salesman help you select the proper finish for your product.

For more data, circle 31 on colored card.

"H-Gun" by Spee-Flo, combined with Spee-Flo HydraAirless 20 system produces a spray pattern equal to the best air-atomized gun, and without overspray. Controlled film thickness from ½ to 3 mils or more can be applied with the HydraAirless 20 and the new H-Gun. An unheated system will now produce the results formerly requiring a heated system. Heated system is also offered. The Spee-Flo Co., 6614 Harrisburg Blvd., Houston 11, Texas.

For more data, circle 32 on colored card.

Lea Synstrip is a fast-working, non-corroding liquid stripper for removing enamel, lacquer and synthetic coatings. Will not attack aluminum, zinc or any other base metal or alloy. Does not dissolve the coating, but breaks the bond. Lea Coldstrip can be used at room temperature, with minimum ventilation and can be filtered for continuous use. Lea Mfg. Co., 16 Cherry Ave., Waterbury 20, Conn.

For more data, circle 33 on colored card.

Graining Plates of any pattern, size or shape (wood grain, leather, marble, fabric, etc.) for hand or machine graining. American Richwood Products Co., 104 E. Mason St., Milwaukee 2, Wis.

For more data, circle 34 on colored card.

BFC Chromic Acid (flake) is available from Better Finishes & Coatings, Inc., 268 Dormeus Ave., Newark 5, N. J. Every batch is checked, and every can filled with a full weight of extra-high quality Chromic Acid. Prompt delivery from factory and nearby distributor stocks.

For more data, circle 35 on colored card.

"Magic Tack Rags" are scientifically made to create the "tack" that picks up dirt, sand, and foreign matter on the surface to be finished. Will not dry hard—but retains "tack" indefinitely. Wm. Juergens Mfg. Co., P. O. Box 143, Station C, Toledo, Ohio.

For more data, circle 36 on colored card.

Pearlchrome, Chroma Sheen, Trichlor Finishes, lacquers, varnishes, synthetic enamels and primers are just a few of the Proven Quality Finishes by Boydell Bros. Co., 1121 E. McNichols, Detroit 3, Michigan. Nearly 100 years of experience and constant research are at your disposal when you need industrial finishes.

For more data, circle 37 on colored card.

Hot Airless Spray Painting by Nordson Corp., 55 Jackson St., Amherst, Ohio, can save up to 30% on paint or other coating materials, and on labor too. Less expensive spray booths are needed, clean-up and housekeeping costs are reduced. Bulletin on Nordson Airless is now available. Find out how Hot Airless spray painting can pay off for you.

For more data, circle 38 on colored card.

Drawer-Glide Waxes, color or colorless, penetrate deep into pores of the wood thereby giving the drawers dimensional stability, a moisture-proof coating and lubricating the surfaces for easy sliding. Drawer Glide Waxes also beautify the wood and give surfaces a smooth, waxy feel. The Prillaman Co., P. O. Box 1024, Martinsville, Virginia.

For more data, circle 39 on colored card.

Strip Coating gives a smooth metered coating, good paint savings, is fast and economical and colors can be applied to both sides simultaneously; different colors and different finishes. Can be used for job coating, siding, awnings, seal fasteners and drapery hardware. Complete fact file on Strip Coating is available from Gasway Corp., 6463 N. Ravenswood Ave., Chicago 26, Ill.

For more data, circle 40 on colored card.

Steinemann Coater applies all finishes uniformly to practically any size or shape of product. There is no waste; unused material is recovered by a recirculating system. For additional information write Wilco Machine Works, Inc., Municipal Airport, P. O. Box 3722 Z, Memphis 14, Tenn.

For more data, circle 41 on colored card.

Gold, Copper and Aluminum are now available in Cres-Lite brilliant, metallic bronze powders. New color card showing the 44 colors now available is free upon request. Special or matched colors can be made. Crescent Bronze Powder Co., 118 W. Illinois St., Chicago 10, Ill.

For more data, circle 42 on colored card.

Hi-Sol Enamel Reducer offers substantial savings in ready-to-spray paint costs. In addition, sagging is practically eliminated and a smoother, better looking finish obtained. Potter Paint Company, Cortland 1, New York and Cambridge City 1, Ind.

For more data, circle 43 on colored card.

Paint Strainers for straining lacquers, enamels, paints or varnishes. Made of heavy paper stock with cloth insets in coarse, medium, fine and extra fine mesh, 6-in. in diameter. Louis M. Gerson Co., Box 175A, Mattapan, Mass.

For more data, circle 44 on colored card.

Drum Upender No. 32 for upending heavy drums, takes the strain and effort out of handling drums of paint, etc. Size and shape of upender spreads lifting pressure over large area to prevent drum damage. Morse Mfg. Co., 763 W. Manlius St., East Syracuse, N. Y.

For more data, circle 45 on colored card.

Natural and Synthetic Pearl finishes in air dry or bake coatings for a variety of products, are offered by Rona Pearl Corp., E. 21st & E. 22nd St., Bayonne, New Jersey. Apply to metal, plastic, wood or glass surfaces.

For more data, circle 46 on colored card.

Automatic Viscosity Control for spraying, flow coating and dipping improves quality of painting and finishing by providing continuous uniformity of paint material. Norcross Corp., 247 Newtonville Ave., Newton 58, Mass.

For more data, circle 47 on colored card.

Tack Cloth for Wiping Dust. It's available in different meshes, in envelopes, rolls or bulk. Lint free, wax free; no danger of spontaneous combustion. Bond Chemical Products Co., 2641 N. Clybourn Ave., Chicago 14, Ill.

For more data, circle 48 on colored card.

INCREASE PRODUCTION! CUT COSTS!
Your paint is factory fresh ready for use when mixed in a
MIRACLE PAINT MIXER
5 GAL. MODEL
¼ Pt. to 55 Gal. Mixers Available
Write to:
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NEARLY 100 YEARS OF EXPERIENCE AND CONSTANT RESEARCH

The Finest in Industrial Finishes!

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YOUR FINISHING PROBLEM IS OURS

1121 E. McNICHOLS **BOYDELL BROS. CO.** DETROIT 3, MICHIGAN

For more data, circle 211 on colored card.

Heavy-Duty Roller Coaters by The Black Brothers Co., Inc., Mendota 12, Ill., apply paints, lacquers, sealers, sizes, stains, waxes, fillers, base coats, etc., to wood, metal, plywood, composition board, hardwood, plastic, etc. Have speed, accuracy, cleanliness and economy. Descriptive literature available.

For more data, circle 49 on colored card.

"Apco Uniformity-Famous" Thinners are being used by industrial finishers for thinning to achieve improved coverage, drying control and production efficiency. Your Apco Solvents man can give you complete details. Apcothinners, Troluoil, No. 10 Mineral Spirits, Dryolene (VM&P) are a few of those available. Anderson-Prichard Oil Corp., Oklahoma City, Okla.

For more data, circle 50 on colored card.

Paint Overspray can be reprocessed in our plant to conform to its original specification in physical and chemical properties. Paint waste overspray or paint sludge can be used again in regular production at considerable savings. Mixed color sludges can be converted to primers. W. C. Richards Co., 3108 W. Vermont St., Blue Island, Illinois.

For more data, circle 51 on colored card.

IDEAL TACK RAGS
FOR A
PERFECT FINISH
Bulk or Bagged
IDEAL CHEMICAL COMPANY
1499 Dean Drive,
South Euclid 21, Ohio

For more data, circle 242 on colored card.

"Bull Dog Shaker," Model 160, conditions paint to brushing consistency in one to 5-gal. cans, without opening the can. Time required is from two to 30 minutes, depending on paint formulation and length of time paint has been on the shelf. Easy to operate. Grenier & Co., Inc., 13142 Rexford St., Blue Island, Ill.

For more data, circle 52 on colored card.

Agateen #27 is the crystal clear air-dry lacquer for use on watch dials. Bake coatings, dipping lacquers, spraying lacquers and air-dry lacquers are also available. Agate Lacquer Mfg. Co., Inc., 11-13 43rd Road, Long Island City 1, N.Y.

For more data, circle 53 on colored card.

"Hammermark" Finishes are available in colors and have the function of hiding imperfections. Are impervious to duplicating inks, cleaning and office chemicals, are mar-proof. Available in bake and air-dry and in all pearlescent colors and shades. Sample panel available. Advise your method of application. United Lacquer Mfg. Corp., Linden, New Jersey.

For more data, circle 54 on colored card.

Exposure Test. Actual weathering, corrosion and sunlight tests, direct and under glass for quick predetermination of durability and permanency in southern Florida by South Florida Test Service, Inc., 4301 N. W. 7th St., Miami 34, Fla.

For more data, circle 55 on colored card.

Wood Lacquers and clear and shaded synthetic coatings, texture enamels, aircraft finishes, clear metal finishes, thinners, dopes and chemical coatings are just a few of the many coatings by Randolph Products Co., Carlstadt, N. J.

For more data, circle 56 on colored card.

PROTECT LUNGS *against*
PAINT SPRAY – DUST – FUMES

DUPOR No. 4 RESPIRATOR has big double filters for easy breathing and greatest filtration! Soft rubber face mask gives airtight fit. Patented DUPOR valves bring in clean air—throw off breathed air! Weight 4 oz. Economical! Costs only $2.25 postpaid. Order Now!

H. S. COVER CO., Dept. 610, South Bend 14, Ind.

For more data, circle 212 on colored card.

"RediRay" Modular Infrared Ovens fit any finishing system. Provide uniform heat with no hot spots; high efficiency with no bulbs, tubes or reflectors to get dirty, burn out or break; complete flexibility, adaptable to any conveyor system. Engineering Data Sheet No. 112 describes RediRay and its applications. Infra-Red Systems, Inc., 240 Rt. 23, Riverdale, N. J.

For more data, circle 57 on colored card.

Compressed Air Dryers prevent damage due to moisture and dirt in air-lines used for finishing operations. Van-Air Dryers extract water and contaminating particles down to sub-micronic size, deliver air uniformly clean and dry for spraying, blasting, etc. Write for 12-page brochure. Van Products Co., 5744 Swansville Road, Erie, Penna.

For more data, circle 58 on colored card.

Interlox Line of cleaning materials includes a product for every need, whether spray or immersion type cleaner is used, single or multiple-stage. Interlox baths are long-lived and require less additions and control. Northwest Chemical Co., 9310 Roselawn, Detroit 4, Michigan.

For more data, circle 59 on colored card.

"Catalan" is the catalyst finish in either gloss or satin finish. Is tough, mar-resistant and waterproof; in clear and colors. Saves on baking cost and on forced air-drying time. Consult our laboratory staff technicians for advice on any finishing problem. J. Landau & Co., Inc., Carlstadt, N. J.

For more data, circle 60 on colored card.

Detrex Electrolytic Cleaners reduce rejects, and re-runs and increase production. There is a cleaning process for all of your cleaning needs whether zinc, steel, brass, copper or nickel. A Detrex Service Engineer can give you complete information and recommendations. Detrex Chemical Industries, Inc., Box 501, Dept. IF-759, Detroit 32, Michigan.

For more data, circle 61 on colored card.

Radcor Ovens for baking and drying are the electric infrared ovens of all types and sizes; complete systems or modules. Radcor ovens accommodate all of the accepted infrared heat sources, covering near and far infrared, including metal sheath heaters, quartz lamps, quartz tubes and G-30 lamps. Radcor, Inc., Bradner, Ohio.

For more data, circle 62 on colored card.

Flock Silences Noises, dampens vibration, adds beauty, color and sales appeal to many products. Flock is available in cotton, rayon or acetate fibers and is easy to apply to wood, metal, plastic. Bulletin, samples and technical service are available from Cellusuede Products, Inc., 517 N. Madison St., Rockford, Ill.

For more data, circle 63 on colored card.

"Econ-O-Veyor" Overhead Conveyor provides full rolling contact at all points for low chain pull and longer life, a single well-controlled lubrication point, open construction for cleanliness, no roller or sprocket turns allow simplified installation and maintenance and low initial cost. Suitable for use in electrostatic spraying inasmuch as it moves smoothly without jerks to assure even application, due to conveyor construction. For difficult conveyor problems get full details about the "Econ-O-Veyor" line. Creamery Package Mfg. Co., Inc., 224 Glen Cove Ave., Glen Cove, N. Y.

For more data, circle 64 on colored card.

Grain and/or Roller Coating; flat and curved surfaces, edges, etc., with or without steady belt feed. Small and large machines. Kent Rotary Equipment Co., 1507 S. Downey Rd., Los Angeles 23.

For more data, circle 65 on colored card.

For more data, circle 243 on colored card.

"GRIPALLOY"
. . . Attractive satin sheen primer in black and colors . . .
. . . Amazing tight adhesion to 25 different metals as reported by a large electrical manufacturer . . .
. . . Excellent resistance to Salt Spray, Gasoline and Solvents.
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"What Makes Our Finishing Cost So High?"
"Abrasives, Their Use in Surface Preparation"
"The Piano Finish"
"Butyrate Topcoat Lacquer Used in Furniture Plant"
"Use Push Button Spray to Touch Up Marred Finish"
"Eastern Cabinet Co. Goes to Hot Lacquer"
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"Viscosity Measurement"
"Automatic Viscosity Control for Mass Production Finishing"
"Acrylic-Butyrate Lacquer for Wood Furniture"
"'Big Deal' Industrial Paint Samples"
"Finishing Steel Office Furniture"
"A Methods Engineer Analyzes Paint Selling"
"Lithographing Metal Sheets for Cans"
"Finishing Wood Turnings in a Tumble Barrel"
"What's the Big Plus Value in Selling Finishes?"
"Paint Users' Tests; Be Fair; Get Results"
"A Small Paint Laboratory for the Small Paint User"
"Practical Finishing Systems for Magnesium"
"Spray Problems With Hot Lacquers"
"Stains and Their Use in Wood Finishing"
"Cleaning and Conditioning Metal Surfaces for Coatings"
"Applied Decorative Effects to Molded Plastics"
"Preparation of Particle Board for Painting or Finishing"

Industrial Finishing Magazine
1142 N. Meridian St., Indianapolis 4, Ind.

"Dulux" Enamels meet highly specialized finishing requirements in a wide range of application techniques. Withstand sunlight, weathering and temperature extremes. Can be applied to metal before fabrication and does not chip, peel or crack during fabrication operation. E. I. duPont deNemours & Co., Inc., Finishes Divn., Wilmington 98, Dela.

For more data, circle 66 on colored card.

New 303 Finishing Machine is available in four sizes, with many optional features. Work to be finished is held either by vacuum or mechanically. Can be used for finishing metals, woods or plastics. Write your finishing requirements. Clair Mfg. Co., Inc., Olean, New York.

For more data, circle 67 on colored card.

Dupor No. 4 Respirator has double filters for easy breathing and greatest filtration of paint spray, dust and fumes. Soft rubber face mask gives an air tight fit. Patented Dupor valves bring in clean air and throw off breathed air. Weighs only 4-oz. H. S. Cover, P. O. Box 2508, South Bend 14, Indiana.

For more data, circle 68 on colored card.

"Pearl Glo" Synthetic Pearl Pigment can be sprayed or dipped on any sealed surface of plastic, metal, wood, leather, paper, etc. Can also be incorporated into acrylics, polyester, vinyl, etc. Gives a pearl finish at low cost. Sample available. Specify application and choice of vehicle. Argenta Products Co., Garnerville, N. Y.

For more data, circle 69 on colored card.

Airless Graco Hydra-Spray eliminates atomizing air, gives fast coverage with less material and cuts costs of applying protective coatings. Models are available for hand or air operation. 8 standard models, portable or stationary units, pump direct from 5 to 19-gal. pails or 55-gal. drums, plus sealed standpipe unit for circulating systems. Gray Co., Inc., 43 Graco Square, Minneapolis 13, Minn.

For more data, circle 70 on colored card.

Mar-Proof Lacquer, by The Schaefer Varnish Co., Inc., Louisville, Ky., is a performance-proven finish that cannot be easily marred or scratched. Made in either clear gloss rubbing or satin finish, it produces a transparent coating of full depth on maple, walnut, gum, mahogany and other cabinet woods. Working samples furnished without obligation.

For more data, circle 71 on colored card.

12,000 Standard Spray Nozzles for more exact performance to fit your needs, are described and illustrated in Catalog No. 24, available from Spraying Systems Co., 3240 Randolph St., Bellwood, Ill. Nozzles can be obtained in a choice of patterns, capacities, materials, spray nozzle types.

For more data, circle 72 on colored card.

Restore Paint to its original consistency without opening the container, whether in ¼-pint cans or in 55-gallon drums. Time required is only 2-minutes per gallon. Full information from Miracle Paint Rejuvenator Co., 128 E. 10th St., St. Paul.

For more data, circle 73 on colored card.

"Gripalloy" Primer for 25 Metals is available in black and colors; excellent adhesion . . . and resistance to salt spray and solvents. Tenax Finishing Products Co., 390 Adams St., Newark 5, N. J.

For more data, circle 74 on colored card.

Finer Furniture Finishing is done on a DeBurgh Conveyorized System, according to George Koch Sons, Inc., Evansville 4, Indiana, designers, engineers and builders. Work may be freely rotated on individual pallets. Saves labor, floor space, time and money. Literature available.

For more data, circle 75 on colored card.

Non-Grain-Raising Stains, lacquers and everything for finishing fine furniture, cabinets, pianos, etc., plus styling and technical service—in Southeast U. S. A., are available from Snyder Bros. Co., P. O. Box 631, Toccoa, Georgia.

For more data, circle 76 on colored card.

"Electro-Cold Stripper" will strip vinyls, alkyds, japans, hammers, primers, wrinkles, enamels and epons in minutes. Is non-flammable, requires no heat or current. Complete data and testing sample free on request. Allied Finishing Specialties Co., 2641 W. Grand Ave., Chicago 12.

For more data, circle 77 on colored card.

Melaqua 600 is water-soluble, hard, solvent-resistant, colorful and non-inflammable. Melamine resin makes Melaqua hard and solvent-resistant and is combined with an acrylic polymer for color, high gloss and weather resistance. Melaqua can be the vehicle for a baking enamel with good characteristics of both the emulsion system and water-soluble system. American Cyanamid Co., Plastics & Resins Divn., 30 Rockefeller Plaza, New York 20, N. Y.

For more data, circle 78 on colored card.

One-Coat-Spray Aluminum Paints made with Alcoa Aluminum Pigments have good durability and appearance, resistance to weather and abrasion, and lower production costs. A wide range of metallic finishes that give extra protection and build are available. Aluminum Co. of America, 1746-F Alcoa Bldg., Pittsburgh 19, Penna.

For more data, circle 79 on colored card.

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"MAGIC" TACK RAGS

IMPROVE YOUR FINISH 100% ! !

"MAGIC" TACK RAGS remove specks, lint, and sand particles on the surface of metal, wood or material to be finished. "MAGIC" TACK RAGS remain tacky indefinitely, and are spontaneous combustion proof. Sample upon request.

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For more data, circle 246 on colored card.

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Takes the strain and effort out of upending heavy drums. Has 40" handle offset 35° for top efficiency. Hefty 1¼" hook provides clearance for largest chime. 2½" x 8" toe plate spreads lifting pressure over large area to prevent drum damage. Order Several Today!

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Instant Stripper—For metal or wood finishes. A non-flammable, non-toxic stripper which removes almost instantly, most finishes—enamels, either lacquer or synthetic (baked or air dried), paints, varnishes, etc. V. J. Dolan & Co., Inc., 1830 N. Laramie Ave., Chicago 39, Illinois.

For more data, circle 80 on colored card.

Tack Rags for use prior to painting, to wipe off and hold dust and dirt particles too small to see, but which might leave a blemish on the final coat of paint or finish, are available from Ideal Chemical Co., 1499 Dean Drive, South Euclid 21, O.

For more data, circle 81 on colored card.

Uniflo Stains are finely dispersed pigment stains which can be applied by spray or brush to close-grained woods such as poplar, gum, maple and birch. Do not require wiping. Give appearance of a wiping stain; air-dry in one hour. Can be sprayed on hard-to-reach corners without showing white lines. The Lawrence-McFadden Co., Inc., 7430 State Road, Philadelphia 36, Penn.

For more data, circle 82 on colored card.

"Chainveyor" is the fully integrated overhead conveyor system that completely eliminates intermediate handling through spray painting and baking sequences, thus cutting overhead and increasing production. Illustrated catalog contains explanatory diagrams and grid sheets for preliminary layouts. Chainveyor Corp., 5618 E. Washington Blvd., Los Angeles, Calif.

For more data, circle 83 on colored card.

Reynosol Steel Coating has good light resistance, tensile strength, abrasion resistance, alkali and acid resistance, oil resistance, hardness, and fire resistance. Exhaustive laboratory testing, consistent quality control, new production techniques work for your product when you specify Reynosol. Reynolds Chemical Products Co., Divn. of Stubnitz Greene Corp., Whitmore Lake, Michigan.

For more data, circle 84 on colored card.

Tweed Multi-Color Textured Finish is available in a variety of colors and patterns. Fills and covers rough surfaces; eliminates costly finishing procedures and prolongs the life of finished surfaces. Information and free "Tweed" brochure available. Raffi and Swanson, Inc., 100 Eames St., Wilmington, Mass.

For more data, circle 85 on colored card.

Aerosol Finishes — coustom-loaded by Sprayon—never vary in color or performance, as they are tested and proved in Sprayon's quality-control laboratory where paint chemists and paint technicians make sure of this fact. All test data, materials and samples are dated, coded and filed for future reference. Sprayon Products, Inc., 2065. E. 65th St., Cleveland 3, Ohio.

For more data, circle 86 on colored card.

Reverse Roll Coater for eliminating imperfections in hardboard panels and other material, are available from Schmutz Mfg. Co., 1600 W. Main St., Louisville 3, Ky. Machines are heavily and accurately built and are obtainable in two sizes for 36-in. and 48-in. panels, any length, and up to 2-in. thick. Other wood graining machines are also available.

For more data, circle 87 on colored card.

Metaclean No. 268 cleans metal at room temperature. A non-corrosive alkaline cleaner it removes oil, chips and other soil from metal. Eliminates fire hazards. Metasurf Corp., 12830 Eaton, Detroit 27, Mich.

For more data, circle 88 on colored card.

"Nacromer" Synthetic Pearl Essence adds unusual new life and brillance to most coating materials. No extra finishing equipment is needed, just incorporate Nacromer into your coating material and apply by your usual method. Can be applied to wood, metal, plastic, paper, leather and many other materials. The Mearl Corp., 41 E. 42nd St., New York 17, N. Y.

For more data, circle 89 on colored card.

Cabinet Finishes for metal storage cabinets and shelves, available from Minnesota Paints, Inc., Minneapolis 15, Minn., resist scratching, banging and scuffing. "The Man from Minnesota" can find out your most effective and economical paint formulation for your application.

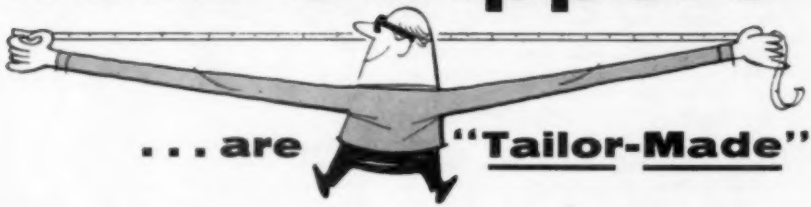
For more data, circle 90 on colored card.

F. R. Assemblies can make your old bulb-type oven more efficient. Install driQuik F.R. Assemblies and free yourself of the expense of replacing burned-out infra-red bulbs. Units fit your present oven and save the cost of a new oven. Can be replaced in two easy steps. Dry Clime Lamp Corp., Greensburg, Indiana.

For more data, circle 91 on colored card.

▶Dober

COLD Strippers



. . . are "Tailor-Made"

▶ Why use an "all-purpose" paint stripper when you can get one "tailor-made" or specifically formulated for your own individual needs?

Send your inquiry and let us tell you what we can do for you or, better still, send parts to be stripped and let us *show you*—and *tell you* —what we can do for you.

"When other strippers fail — come to Dober."

▶DOBER Corporation

4725 S. TALMAN AVE., CHICAGO 32, ILL.

For more data, circle 214 on colored card.

Coating Materials by Tousey Varnish Co., 520 W. 25th St., Chicago 16, Ill., can be applied by dipping, flow coating, hot dipping, automatic, electrostatic and airless spray. 75 years of experience can help you obtain a finish for your metal product.

For more data, circle 92 on colored card.

"CrysCoat 187" is the cleaning-phosphating process by the tank-immersion process. Its detergent and solvent action removes a variety of smuts and shop oils then converts steel surfaces to a dense phosphate layer that keeps out rust, bonds paint tightly. Free bulletin available. Oakite Products, Inc., 20 Rector St., New York 6, N. Y.

For more data, circle 93 on colored card.

Barcotone Multicolor is resistant to wear, scuffing and chipping. A selective arrangement of 24 color combinations to suit any motif are available. This textured finish gives eye appeal and sales appeal. Marine grade for boat interiors and outdoor use, as well as coatings for fixtures, displays, novelties, etc., are obtainable. Barrett Varnish Co., 1532 S. 50th Court, Cicero 50, Ill.

For more data, circle 94 on colored card.

"Expray-AP" Rustproofs all machined metals, removes fabricating oils, chips and dust deposited during machining and grinding. Will not etch or corrode zinc die castings, retains high detergent action at any temperature. Also works well with brass, copper and bronze; gives no obnoxious fumes. Complete information can be obtained from Wyandotte Chemicals Corp., Wyandotte, Mich.

For more data, circle 95 on colored card.

Alemite "78" Paint Pumps have double pumping action that draws material in and forces material out simultaneously on both up and down piston stroke. Have high volume, maximum capacity, require minimum maintenance. "78" paint pumps use less air to deliver more paint through longer supply lines and more outlets. Alemite Divn., Stewart-Warner Corp., 1850 Diversey Parkway, Chicago 14, Ill.

For more data, circle 96 on colored card.

Abrasion-Resistant Finishes that withstand the pounding and grinding action of a ton of coal rushing over their surfaces are available from The Glidden Co., Industrial Paint Divn., 900 Union Commerce Bldg., Cleveland 14, Ohio. Glidden formulations meet your requirements against impact, humidity, heat, cold, corrosion, etc. Let the Glidden salesman give you full information.

For more data, circle 97 on colored card.

Wood Reproductions on steel, low cost woods, composition board, and plastics, take on the appearance of beautiful wood grains, leather, fabrics, mother-of-pearl or a pattern of your own, when finished by the Polyfax Process. Polyfax precision engravings, ground-coats, inks and clears, a complete system, allow you to "dress-up" your product. Bulletin "The Key to Distincive Styling," giving information on IC Polyfax, is available. Interchemical Corp., 224 McWhorter St., Newark 5, N. J.

For more data, circle 98 on colored card.

"Plextone" Multicolored Textured Finish has one-coat application of two or more interlaced colors sprayed at one time from one gun. Coating has good durability and wide application; can reduce finishing costs 35%. 1960 color card available upon request. Maas & Waldstein Co., 2110 McCarter Highway, Newark 4, N. J.

For more data, circle 99 on colored card.

Binks Model 21 Automatic Spray Guns methodically apply a uniform coating to products being sprayed. Guns are pneumatically turned on and off at the beginning and end of each stroke to conserve paint. Bulletin 975 describes this model and other spray finishing equipment, methods and systems. Binks Mfg. Co., 3116 Carroll Ave., Chicago 12, Ill.

For more data, circle 100 on colored card.

Anospray Baked Organic Metal Treatment for aluminum and other alloys gives good corrosion resistance and exterior durability. Can be used on brass, chrome and many alloys which do not lend themselves for bright anodizing. Can be applied by spray, dip or brush. Titanine, Inc., Morris & Elmwood Aves., Union, N.J.

For more data, circle 101 on colored card.

Aro Bulk Paint Handling System can save on paint handling costs, finishing material costs, provide better finish and quality control and reduce your fire and explosion hazard. Aro System will pay for itself in 12 months. The Aro Equipment Corp., Bryan, Ohio.

For more data, circle 102 on colored card.

Perfex Satin Finishes for caskets need no rubbing. Perfex is the original "flat" made by a new and different process, without the use of stearates or flattening agents, that gives a rubbed appearance without a costly rubbing operation. Perfection Paint & Color Co., Indianapolis 2, Indiana.

For more data, circle 103 on colored card.

Butyrate Top-Coat Lacquers, made with half-second butyrate, the Eastman film-former, dry dust-free in minutes, will not yellow with age, and are stain resistant. Suitable for preserving finish on outdoor aluminum and provide lasting protection for quality wood finishes. Eastman Chemical Products Co., Kingsport, Tenn.

For more data, circle 104 on colored card.

Dober Cold Strippers are "tailor-made" or specifically formulated for your own individual needs. Send sample of parts to be stripped and Dober will tailor make a cold stripper for your particular needs. Dober Corp., 4725 S. Talman Ave., Chicago 32, Ill.

For more data, circle 105 on colored card.

One of the industry's most perplexing problems is the removal of buffing compounds from finished metals. This Enthone researcher is evaluating a new cleaning agent as a buffing compound remover. Samples will be carefully examined after cleaning so that efficacy of the new cleaner can be precisely charted. Photo, courtesy of Enthone, Inc.

Fire Retardent Paints

A 12-page illustrated bulletin (4x9-in.), printed in two colors, reveals information about Albi intumescent fire-retardant paints for use wherever a fire retardant coating is needed or wanted. A free copy is now offered by The Albi Mfg. Co., Inc., Rockville, Connecticut.

For more data, circle 106 on colored card.

Paint Circulating Systems; Air Powered Pumps

A 44-page (8½x11-in.) illustrated catalog, printed in two colors, shows pictures, diagrams and tabular information on paint circulating systems, drum and tank agitators (paint stirrers), airless spraying, paint pumps and other spray painting accessories. For a free copy, write the Gray Co., Inc., 43 Graco Square, Minneapolis 13, Minnesota.

For more data, circle 107 on colored card.

Compressed Air Dryers

A line of self-contained, plug-in compressed air dryers is announced by Technical Designs, Inc., 119 Northfield Rd., Bedford, Ohio.

Using refrigeration principles, these units deliver a continuous supply of dry compressed air to spray guns and various air tools. Condensed water is automatically and continuously ejected from the unit. A technical bulletin will be sent on request.

For more data, circle 108 on colored card.

Car Wheel Masks. The amount of time required to "get-ready" and "clean-up" in the spray painting of automotive finishes has been reduced by new polyethylene film wheel covers.

The Martin-Senour Paint Co. has designed polyethylene film covers to protect car wheels. Due to a special back fold, the covers can be easily draped over each wheel without the usual bother of individual clamping, tying or taping that is necessary with ordinary methods. The strong film made from Bakelite polyethylene assures that the covers can be reused many times.

Radiant Heat Systems by Burdett Mfg. Co., 4920 S. Monitor Ave., Chicago 38, Ill., assures a finish that's on to stay with extra advantages of lower cost and increased output. Burdett engineers can be helpful to you in simplifying your finishing problems.

For more data, circle 109 on colored card.

Eclipse Auto-Rod Literature

A 2-page folder shows and describes the new Eclipse Auto-Rod, automatic air-operated spray gun. Cut-away and diagram views show dimensions and working parts of this dependable, efficient and fast spray gun. The manufacturer is Eclipse Air Brush Co., 390 Park Ave., Newark 7, New Jersey.

For more data, circle 110 on colored card.

Latex Paints. The production and use of emulsion and latex paints continue to show a steady growth. The popularity of these latex paints is a result of their easy application, quick drying, good practical one-coat covering, and freedom from a "painty" odor. There can be little doubt that emulsion and latex paint systems present the most difficult problem of attaining the maximum efficiency from a pigment. The vehicle itself is not ideally suited to the dispersion of pigments and requires the presence of various additives and peptizing agents.—Pigment News.

CLASSIFIED ADVERTISING

PAINT SALESMAN WANTED.

Old established industrial finishes company located in Newark, N. J., wants an experienced salesman with a following in this field. We are ready to turn over a sizable number of house accounts to the right man. Salary and commission. Give complete background in first letter. All replies will be kept in strict confidence. Address IF-765, care Industrial Finishing.

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From Wood Furniture manufacturer to work in our stain and lacquer laboratory matching colors and developing new finishes. Must be experienced and capable of doing service work. Good salary. PERFECTION PAINT & COLOR CO., Indianapolis 2, Indiana.

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Technically qualified man who knows metal cleaning and hot painting. Set-up, trouble shoot, cleaning, thinning, baking, spraying, using wide variety of special coatings. Take full charge of personnel. Address IF-761, care Industrial Finishing.

POSITION WANTED.

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DIRECT SALES REPRESENTATIVE WANTED.

Well-known manufacturer of industrial pumps and spray equipment requires two sales representatives—one for east coast and one for west coast. Requires some background in industrial finishing. Salary and bonus arrangement. Address IF-768, care Industrial Finishing.

CLASSIFIED ADVERTISING

The rate on ads appearing in this department is $1.00 per line of 6-pt. light face type, per insertion. Minimum charge, $5.00. Ads set in 8-pt. extra bold face type cost $2.00 per line, per insertion.

There may be certain firms or individuals to whom you do not want your reply sent. Simply address your communication to the box number in the ad and attach a separate list of names. Place both in a separate envelope addressed to Industrial Finishing Magazine, 1142 N. Meridian St., Indianapolis 4, Ind. If the advertiser is on the list you submit we will then destroy your letter. Names of advertisers using box numbers not revealed.

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Paint finishing supervisor to assist foreman. Thoroughly experienced in decorative parts painting. E. J. MURRAY, FOX CO., Cincinnati 23, Ohio.

ATTENTION: ALL FINISH SALESMEN.

If your present line does not include varnish, you are missing a bet. PERFEX VARNISHES are unexcelled (yes, unequalled) and are well known by volume finish users. Look at our display advertisement on page 81 of this magazine. If you are interested in the possibility of taking on PERFEX VARNISH in addition to your present line, write us. All replies will be held in strict confidence. PERFECTION PAINT & COLOR CO.

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Must have five years or more production finish and industrial coating sales experience, preferably in Pittsburgh area. Excellent company offering secure remuneration plan with adequate base salary (adjustable to man's experience and potential), plus commissions. STRICTLY CONFIDENTIAL. Fee negotiable. Call for appointment or write LIKEN EMPLOYMENT AND PERSONNEL SERVICE, 643 Liberty Ave., Pittsburgh 22, Pa., EXpress 1-1866.

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WANTED—CHIEF CHEMIST

For progressive medium-size Midwestern paint manufacturer. Must be able to formulate. Knowledge of metallic paints desirable but not necessary. Excellent opportunity for assuming important position with growth prospects as Chief Chemist and Technical Director. Address IF-762, care Industrial Finishing.

INDUSTRIAL FINISHES FORMULATOR.

We have an opening for a graduate chemist or chemical engineer preferably with experience in the development of a general line of industrial finishes. This experience may include development in one or more of the following: coatings for narrow and wide strip, appliance finishes, container and closure coatings, etc. We are primarily interested in a man with a good general industrial finishes background who is prepared to undertake independent development.

This position offers challenging work on new intriguing technical developments in modern well-equipped laboratories with top-flight technical associates, excellent benefits, ample opportunity for growth and salary commensurate with experience.

Forward resume for confidential review to

C. M. Jackson
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Excellent positions available now! Potential & earnings are unlimited. Messrs. **FRANK STACY & DAN STEARNS** are specialists in your field and can give you dignified, confidential coverage of the national market. For details **PHONE—WIRE or WRITE**

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Personnel Manager

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INDUSTRIAL SALESMAN WANTED

For Northern Ohio and Indiana. PRATT & LAMBERT, INC., Buffalo 7, New York, Industrial Division.

SALESMAN—INDUSTRIAL FINISHES.

If you are bogged down in your present position—

If you are accustomed to earnings well up in five figures (or if you feel you have the potential)—

If you see no real future with your present firm—

If you are aggressive—

If you want real security—

YOU'RE FOR US AND WE'RE FOR YOU

Write or wire today. We're in the Newark area, well established and growing every day. Replies confidential. Address IF-764, care Industrial Finishing.

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Send samples and letters giving approximate contents. GET CASH FOR SCRAP. THE JOHANN COMPANY, 13900 Grant St., Dolton, Illinois. Phone Dolton 4850.

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Flat Mill White and Tints, Latex or Oil Base $2.95 gal. FOB Milwaukee. We match your color chip.

Highest standard quality, 3 factories, your order on its way the same day. 5's only. We manufacture all types factory maintenance paints. Give us a trial, you'll be glad you did. EASTERDAY PAINT & CHEMICAL CO., 1306 E. Bolivar, Milwaukee 7, Wisconsin.

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Don't send your grinding discs to the dump. Our reconditioning process restores them to a high degree of efficiency—not a recoat process. Minimum quantities of 500 monthly is of interest to us. Write us for further details stating what you have. FAYETTE DISTRIBUTORS, INC., 418 W. 22nd St., Box 365, Connersville, Indiana.

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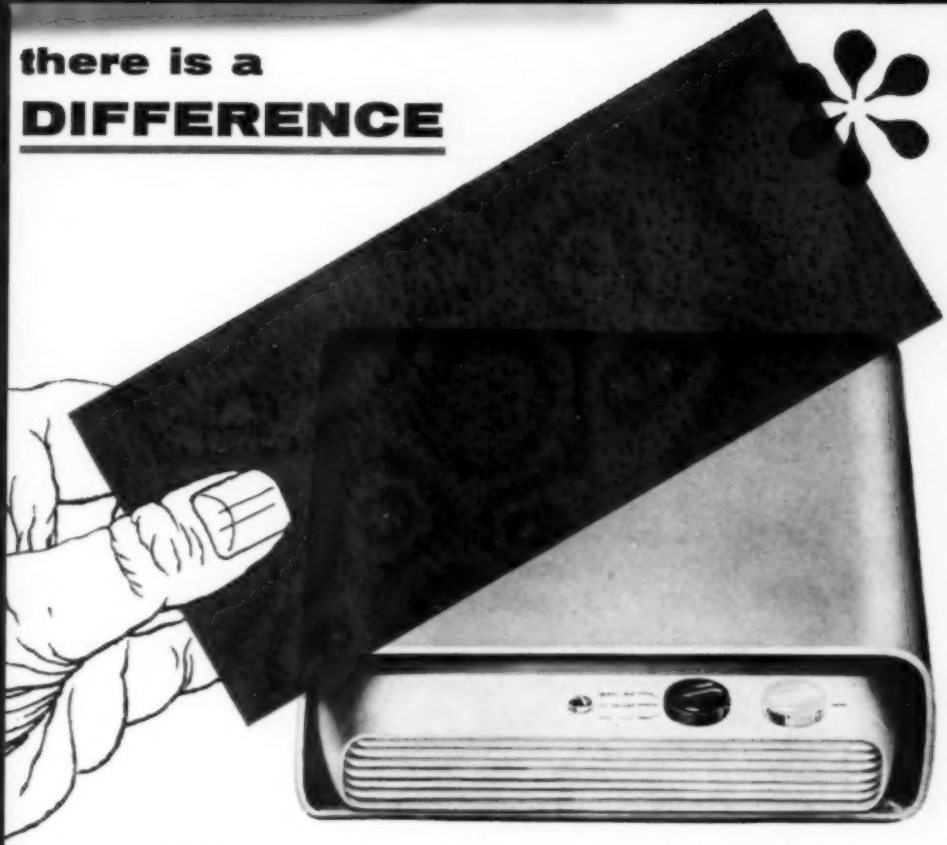

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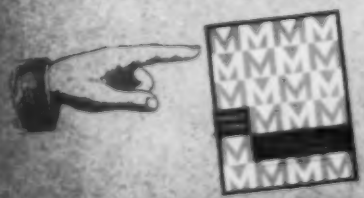

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